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To be filled in by Navigating Officer.

[In Chart Depôts the two first columns are alone to be filled up.]

Whether Supplement or Hyd. Notice.	Date of Publication and Number.	Whether pasted in or noted in Margins of Book, and Date of such Correction.

THE RAMAKRISHNA MISSION INSTITUTE OF CULTURE
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NOTICE.

HYDROGRAPHIC DEPARTMENT, ADMIRALTY.

In January of each year the information affecting this book, which has been published during the preceding year in the Admiralty Notices to Mariners, is compiled and issued as a separate publication. If a Supplement has been issued during the year, this publication will only include Notices issued since the date of the Supplement. Mariners are advised to procure copies of these publications. They can be obtained gratuitously from the Admiralty Agent or Sub-Agents for the sale of charts on presentation of the coupons on the next page, either personally or by letter. In the latter case the cost of postage must be enclosed.

The Supplements or Hydrographic Notices to this book which may be published can also be obtained in a similar manner on presentation of the coupons below.

A. M. F.

Supplement or Hydrographic Notice, No. 3, to Red Sea and Gulf of Aden Pilot. 1909.

Supplement or Hydrographic Notice, No. 2, to Red Sea and Gulf of Aden Pilot. 1909.

Supplement or Hydrographic Notice, No. 1, to Red Sea and Gulf of Aden Pilot. 1909.

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Summary of Notices to Mariners published during 1918, affecting

RED SEA AND GULF OF ADEN PILOT. 1909.

Summary of Notices to Mariners published during 1917, affecting

RED SEA AND GULF OF ADEN PILOT. 1909.

Summary of Notices to Mariners published during 1916, affecting

RED SEA AND GULF OF ADEN PILOT. 1909.

Summary of Notices to Mariners published during 1915, affecting

RED SEA AND GULF OF ADEN PILOT. 1909.

Summary of Notices to Mariners published during 1914, affecting

RED SEA AND GULF OF ADEN PILOT. 1909.

Summary of Notices to Mariner published during 1913, affecting

RED SEA AND GULF OF ADEN PILOT. 1909.

Summary of Notices to Mariner published during 1912, affecting

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RED SEA AND GULF OF ADEN PILOT. 1909.

Summary of Notices to Marine published during 1910, affecting

RED SEA AND GULF OF ADEN PILOT 1909.

Summary of Notices to Marine published during 1909, affecting

RED SEA AND GULF OF ADEN PILOT 1909.

CANCELLED

1909.

Price Three Shillings and Sixpence.

THE

RED SEA

AND

GULF OF ADEN PILOT,

CONTAINING DESCRIPTIONS OF

THE SUEZ CANAL, THE GULFS OF SUEZ AND AKABA, THE RED SEA AND STRAIT OF BAB-EL-MANDEB, THE GULF OF ADEN WITH SOKÓTRA AND ADJACENT ISLANDS, AND THE SOUTH-EASTERN COAST OF ARABIA TO RAS-AL-HADD.

SIXTH EDITION.

1909.

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TO

THE SIXTH EDITION.

THE Red Sea and Gulf of Aden Pilot comprises directions for the navigation of the Suez canal, the gulf of Suez and the central track for steamships through the Red sea, strait of Bab-el-Mandeb, and gulf of Aden; also, descriptions of the gulf of Akaba, the African and Arabian coasts of the Red sea, and gulf of Aden, including Sokótra and adjacent islands, and the south-eastern coast of Arabia to Ras-al-Hadd. It was originally published in two volumes as (1) The Red Sea Pilot, (2) The Gulf of Aden Pilot.

The second edition of the Red Sea Pilot (1873) was compiled by Staff-Commander J. Cumins Richards, R.N., from sailing directions drawn up by Commanders R. Moresby and T. Elwon, of the Indian Navy, and published in 1841, by order of the Court of Directors of the East India Company; and information from more recent authorities, including the surveys of 1871-72 by H.M. ships *Newport* and *Shearwater*, Captain G. S. Nares, R.N.; these surveys embraced the Gulf of Suez and the West coast of the Red sea from thence to Koseir.

The third edition, published in 1883, included the results of the surveys made by Commanders W. J. L. Wharton, R.N., and Pelham Aldrich, R.N., in H.M.S. *Fawn*, 1876-82.

The Gulf of Aden Pilot was originally compiled by Commander C. Y. Ward, I.N., in 1863, from the following authorities, chiefly officers of the late Indian Navy:—

The Somali coast from the strait of Bab-el-Mandeb to Ras Hafun was chiefly from the surveys of Captain Carless, I.N., in 1838; Lieutenant W. C. Barker, I.N., in 1841; and Lieutenant A. M. Grieve, I.N., in 1848.

The island of Sokótra was from the survey of Captain S. B. Haines, I.N., in 1834-35; and the islands westward of it from the survey of Lieutenant A. M. Grieve, I.N., in 1848.

The Arabian coast, from the strait of Bab-el-Mandeb to Ras Al-Hadd, was from the surveys of Captain S. B. Haines, I.N., in 1833-34-35; Captain J. P. Sanders, I.N., in 1844-45; and Lieutenant A. M. Grieve, I.N., in 1846-48-49; including a Memoir by H. J. Carter, Esq., Bombay Medical Service.

The description of the prevailing winds and currents was from the same sources, as also from the investigations made by Lieutenant A. D. Taylor, I.N.; Lieutenant Ferguson, I.N.; and the Admiralty Wind and Current Charts.

A second edition of the Gulf of Aden Pilot, published in 1882, was prepared by Captain G. H. Inskip, R.N. The third edition, published in 1887, was prepared by Staff Commander C. H. C. Langdon, R.N., of the Hydrographic Department.

The Red Sea and Gulf of Aden Pilot, fourth edition, 1891, as issued in one volume, was prepared by Captain E. H. Hills, R.N., and included the results of the surveys by H.M. ships *Rambler*, *Myrmidon*, *Stork*, *Sylvia*,

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and others; as also information derived from H.M. ships and transports, mail steamers, Consular and other Government officers' reports, and official information supplied by the Egyptian, French, and Italian governments.

The fifth edition, 1900, was prepared by Captain John Phillips, R.N.

The present edition begun by Captain E. H. Hills, R.N., was completed by Lieutenant P. C. Pearson, of the Hydrographic Department. It includes remarks from surveys by Commander H. Gedge, *Stork*, 1899; Commander Purey Cust, H.M.S. *Rambler*, 1900; Captain M. Smyth, *Rambler*, 1900; Commander Somerville, H.M.S. *Sealark*, 1904–05; Captain T. Heming, R.N., 1906, and from officers of the Indian Marine; also sketch surveys from officers of H.M. ships employed in the Red sea.

Meteorological Tables have been supplied by the Royal Meteorological Office.

Officers of the Royal Navy and Mercantile Marine are requested to transmit to the Secretary of the Admiralty Notices of any errors or omissions they may discover, as well as any fresh information thay may obtain, with a view to the improvement of this work for the general benefit of navigation.

By the publication of this work, the Supplements and all Notices to Mariners, including No. 164 of 1909, are cancelled.

A. M. F.

Hydrographic Office, Admiralty, London,

February, 1909.

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ARABIC WORDS IN FREQUENT USE IN THE DIRECTIONS AND ON THE CHARTS.

Arabic.	*English.*
Abu or Bu	Father of, *i.e.*, producing or abounding in; also, large.
Bab	A narrow strait or gut; literally, a door or gate.
Bander	A harbour or anchorage.
Balad	A town or village.
Bar	The land.
Beiyat	A shoal, dry at low water.
Ghubbet	A bay or gulf.
Hassar	A rock.
Jebel	A hill or mountain; also an island.
Jezirat	An island.
Kad	A shoal.
Katah or Katat	A patch of rocks.
Kinasat	A shoal or sandbank.
Karn	A peaked hill, a horn, a point.
Kebir	Large.
Khor	A creek or lagoon, an inlet.
Mersa	An anchorage.
Nakhil	A date grove.
Ras	A cape or headland.
Rig	A shallow flat bank, extending off-shore.
Seil	A torrent.
Séria or Seghir	Small.
Shab	A rocky shoal.
Sherm	A creek or small cove.
Umm	Mother of; similarly used to Abu.
Wadi	A valley or river.

[NOTE.—In some parts of the Red sea, the Arabic letter given as *k* in the Roman character is often pronounced as a deep guttural *g*. Thus Akaba is often pronounced Agaba.]

SYSTEM OF ORTHOGRAPHY.

Adopted by the Admiralty for Sailing Directions and Charts.

As far as has been found possible with existing knowledge, native names are spelt in accordance with the following system, which has been adopted by the principal authorities in Great Britain and by the United States, and has been for some years in process of gradual introduction into all Admiralty Sailing Directions and Charts.

No change is made in the orthography of foreign names in countries which use Roman letters; thus French, Spanish, Portuguese, Dutch, &c. names will be spelt as by the respective nations.

1. Where native names have been so long written in a form, which, though not in accordance with this system, has become familiar to English eyes from being so spelt in all charts and maps, they are retained.

2. The true sound of the word, as locally pronounced, is taken as the basis of the spelling.

3. An approximation of the sound is alone aimed at. A system, which would attempt to represent the more delicate inflections of sound and accent, would be so complicated as only to defeat itself.

4. The broad features of the system adopted are that vowels are pronounced as in Italian and consonants as in English; *every letter being pronounced.* Two accents only are used:—

(1) The acute, to denote the syllable on which stress is laid. The use of this is very important, as the sounds of many names are entirely altered by the misplacement of this "stress."

(2) The sign ⌣ over the letter U to denote the short sound of that vowel under certain circumstances. (*See* table.)

5. When two vowels come together, each one is sounded, though the result, when spoken quickly, is sometimes scarcely to be distinguished from a single sound, as in *ai*, *au*, *ei*.

The amplification of the rules is given on the following pages.

Information is invited as to the proper spelling of native names, so as to produce the nearest approximation to the true sound, by this system.

Letters.	Pronunciation and Remarks.	Examples.
a	*ah*, *a* as in *father* - - - -	Java, Banána, Somáli, Bari.
e	*eh*, *e* as in *bet*; *a* as in *fate* - - -	Tel-el-Kebír, Oléleh, Yezo, Levúka, Peru.
i	English *e*; *i* as in *ravine*; the sound of *ee* in *beet*. Thus, not *Feejee*, but	Fiji, Hindi.
o	*o* as in *mote* - - - - -	Tokyo.
u	long *u* as in *flute*; the sound of *oo* in *boot*. *oo* or *ou* should never be employed for this sound. Thus, not *Zooloo* or *Zoulou*, but	Zulu, Sumatra.

Letters.	Pronunciation and Remarks.	Examples.
	The shorter sound of the different vowels, when necessary to be indicated, can be expressed by doubling the consonant that follows. The sounds referred to are as follows:— The short *a* as in *fatter*, as compared with the long *a* as in *father*. The short *e* as in *better*, as compared with the long *e* as in *me*. The short *i* as in *sinner*, as compared with the long *i* as in *wine*. The short *o* as in *sobbing*, as compared with the long *o* as in *sober*. The short *u* as in *rubber*, as compared with the long *u* as in *rubric*.	Yarra, Tanna, Mecca, Jidda, Bonny.*
ŭ	is the same short sound of *u* as is denoted by doubling the consonant following, but is used, and only used, where such doubling is impossible, as in case of words where *u* is followed by two different consonants, as in *Tăng*, pronounced as the English *tongue*.	
	Doubling of a vowel is only necessary where there is a distinct repetition of the single sound.	Nuulúa, Oosima.
ai	English *i* as in *ice* - - - - -	Shanghai.
au	*ow* as in *how*. Thus, not *Foochow*, but	Fuchau.
ao	is slightly different from *au* - - -	Macao.
aw	when followed by a consonant or at the end of a word as in *law* - - - thus	Cawnpore.
ei	is the sound of the two Italian vowels, but is frequently slurred over, when it is scarcely to be distinguished from *ey* in the English *they*, or *ei* in *eight*.	Beirút, Beilul.
b	English *b*.	
c	is always soft, but is so nearly the sound of *s* that it should be seldom used. If *Celébes* were not already recognised it would be written *Selébes*.	Celébes.
ch	is always soft, as in *church* - - - -	Chingchin.
d	English *d*.	
f	English *f*. *Ph* should not be used for the sound of *f*. Thus, not *Haiphong*, but	Haifong, Nafa.
g	is always hard. (Soft *g* is given by *j*) -	Galápagos.
h	is always pronounced when used.	
hw	as in *what*; better rendered by *hw* than *wh*, or *h* followed by a vowel. Thus, *Hwang ho*, not *Whang ho*, or *Hoang ho*.	Hwang ho, Ngan hwei.
j	English *j*. *Dj* should never be put for this sound.	Japan, Jinchucn.

* The *y* is retained as a terminal in this word under Rule 1. The word is given as a familiar example of the alteration in sound caused by the second consonant.

Letters.	Pronunciation and Remarks.	Examples.
k	English *k*. It should always be put for the hard *c*. Thus, not *Corea*, but	Korea.
kh	The Oriental guttural - - - -	Khan.
gh	is another guttural, as in the Turkish -	Dagh, Ghazi.
l m n	As in English.	
ng	has two separate sounds, the one hard as in the English word *finger*, the other as in *singer*. As these two sounds are rarely employed in the same locality, no attempt is made to distinguish between them.	
p	As in English.	
ph	As in *loophole* - - - -	Mokpho, Chemulpho.
th	stands both for its sound in *thing*, and as in *this*. The former is most common -	Bethlehem.
q	should never be employed; the sound of *qu* in *quiver* is given as *kw*. When *qu* has the sound of *k*, as in *quoit*, it should be given by *k*.	Kwangtung
r	As in English.	
s	As in *sin*.	
sh t v w x	As in English. - - - - - -	Sawákin.
y	is always a consonant, as in *yard* and therefore should never be used as a terminal, *i* or *e* being substituted.	Kikūyu.
	Thus, not *Mikindány* or *Wady*, but	Mikindáni, Wadi.
	not *Kwaly*, but	Kwale.
z	English *z* - - - - -	Zulu.
zh	French *j*, or as *s* in *treasure* - -	Muzhdaha.
	Accents should not generally be used, but where there is a very decided emphatic syllable or stress which affects the sound of the word, it should be marked by an *acute* accent.	Tongatábu, Galápagos, Paláwan, Saráwak.

In the case of native names in countries under the dominion of other European powers, in whose maps, charts, &c., the spelling is given according to the system adopted by that power, such orthography is, as a rule, disregarded, and the names are spelt according to the British system Thus the island east of Java in possession of the Dutch is spelt Madoera by them, but on Admiralty charts Madura. A town in Java appears on Dutch charts as Tjilatjap; in the British, Chilachap.

When a foreign language is written in a vocabulary of fixed sounds, so as to permit of transliteration into the British system, a table of equivalents for each letter is drawn up, and names of places can be transliterated without regard to pronunciation.

To reduce Greek names to the orthographic form, required by the foregoing system, would require so many changes, that it has been decided to defer the revision of Admiralty publications until the system has been more generally introduced and used.

The Greek names are therefore left for the present in their old shape, but these give in most cases a very erroneous idea of the sound of the names, as pronounced by Greeks, and in many cases the modern Greek spelling gives a clue to the pronunciation by aid of the table of equivalents.

Thus Εὐβοια now spelt Eubœa is pronounced Evvia.
„ Χαλκις „ Chalcis „ Khalkis.
„ Κεφαλληνια „ Cephallonia „ Kefallinia.

Whenever C appears in a Greek name as at present written it may be taken for granted it has the sound of K.

Greek Letters.	Roman Equivalents by Admiralty System.	Greek Letters.	Roman Equivalents by Admiralty System.
Α α	a	Ρ ρ	r
Β β	v	Σ σ ς	s
Γ γ	g	Τ τ	t
Δ δ	d	Υ υ	i
Ε ε	e	Φ φ	ph
Ζ ζ	z	Χ χ	kh
Η η	i	Ψ ψ	ps
Θ θ	th	Ω ω	o
Ι ι	i	ΑΙ αι	ei
Κ κ	k	ΕΙ ει	i
Λ λ	l	ΟΙ οι	i
Μ μ	m	ΟΥ ου	u
Ν ν	n	ΥΙ υι	i
Ξ ξ	x	ΑΥ αυ	aph, av
Ο ο	o	ΕΥ ευ	eph, ev
Π π	p	ΗΥ ηυ	iph, iv

INFORMATION RELATING TO CHARTS, SAILING DIRECTIONS, AND THE GENERAL NAVIGATION OF H.M. SHIPS.

ON THE CORRECTION OF CHARTS, LIGHT LISTS, AND SAILING DIRECTIONS.

THERE are three descriptions of publications as guides to navigation —the Charts, the Sailing Directions, and the Light Lists—which are all affected by the continual changes and alterations that take place.

Of these the charts should always be, so far as our knowledge permits, absolutely correct to date; and the Light Lists should be noted for the recent alterations, though space will not permit of full details being always inserted; the Sailing Directions, however, cannot, from their nature, be so corrected, and *in all cases where they differ from charts, the charts must be taken as the guide.*

1. *Charts.*—When issued to a ship on commissioning, the charts have received all necessary corrections to date. As sent from the Hydrographic Office they are, as a rule, fresh from the plates. They then receive such corrections by hand in the depôts as are required, and are so issued to the ships.

The charts in the folios should have the same number and title as shown against each in the Lists pasted on the outside of the folio. The Navigating Officer is to satisfy himself that they do so agree before signing the receipt for the same.

All small but important corrections that can be made by hand are notified by Notices to Mariners, and should at once be placed on the charts to which they refer.

Large corrections that cannot be conveniently thus made are put upon the plates, and fresh copies are issued to the ships to replace the others, which are directed to be destroyed to prevent the possibility of their being used in the navigation of the ship.

The dates on which these large corrections are made are noted on the chart plates in the middle of the lower edge; those of the smaller corrections at the left-hand lower corners.

It should be remembered that in addition to the large and small corrections here mentioned, the chart plates are being constantly corrected for numerous details not considered to be of such a nature as to effect safe navigation. For these corrections the charts are not necessarily dated, nor are any Notices to Mariners issued, and it follows therefore that two charts both bearing the same dates of "New Editions" and small corrections may not exactly agree in all respects.

In all cases of quotations of charts, these dates of corrections should be given, as well as the number of the chart (which will be found in the lower right-hand corner), in order that at the Admiralty it may be known what edition of the chart is referred to.

For convenience of office reference each chart has now two numbers, the ordinary number in the right-hand lower corner, and a number in brackets, thus: [429] in the left-hand lower corner, which is now called the New Number.

These new numbers are also given in the Catalogue of Admiralty Charts.

2. *The Light Lists*, annually published at the beginning of each year, are not corrected in the depôts before issue, but appendices are issued every two months, giving the alterations that have taken place, copies of which are put into the chart boxes.

It is the duty of the navigating officer when he receives the set of charts to make notations in the Light Lists from these appendices, and from the Notices to Mariners in the box; and to keep them so corrected from time to time.

The Light Lists should always be consulted as to the details of a light, as the description in the Sailing Directions may be obsolete, in consequence of changes made since publication. The charts also may not be equally up to date in some details, for which no Notices to Mariners have been issued.

3. *The Sailing Directions* are not corrected before issue, except occasionally for very important new rocks or dangers. Hydrographic Notices and Supplements referring to each volume are published from time to time.

Supplements contain all the information received up to date since the publication of the volume to which they refer, and cancel all previous Hydrographic Notices.

Hydrographic Notices contain all information up to date since the publication of the volume, or since the last Supplement or Hydrographic Notice, but endeavour is made to issue no more than one of these affecting each volume, and, on the collection of fresh information, to include the former Notice in a Supplement.

The existence of Supplements or Hydrographic Notices is to be noted, in the tabulated form placed for the purpose inside the cover of each volume, in cases when such notations have not been made before issue, and also on receipt of further Notices after commission.

Notes should be made in the margin of the volume of sailing directions affected, as references to the Supplements or Hydrographic Notices when the latter are printed on both sides.

To enable the books to be more conveniently corrected, however, such Supplements and Hydrographic Notices as are of moderate size are now being printed on one side only, and two copies are issued to each ship, one to cut up, the slips being pasted in at the appropriate place, the other to retain intact for reference.

To make these notations or paste in these slips is one of the early duties of a navigating officer after drawing his box of charts and books, and similar notes are to be made from Notices to Mariners that may thereafter be received.

It must, however, be thoroughly understood that sailing directions will never be correct in all details, except up to the date of the last Hydrographic Notice or Supplement, and that, as already stated, when differences exist, the chart, which should be corrected from the most recent information, should be taken as the guide; for which purpose, for ordinary navigation, they are sufficient.

THE USE OF CHARTS AS NAVIGATIONAL AIDS, AND GENERAL REMARKS RELATING TO PRACTICAL NAVIGATION.

1. *Accuracy of a Chart.*—The value of a chart must manifestly depend upon the accuracy of the survey on which it is based, and this becomes more important the larger is the scale of the chart.

To estimate this, the date of the survey, which is always given in the title, is a good guide. Besides the changes that, in waters where sand or mud prevails, may have taken place since the date of the survey, the earlier

surveys were mostly made under circumstances that precluded great accuracy of detail, and, until a plan founded on such a survey is tested, it should be regarded with caution. It may, indeed, be said that, except in well-frequented harbours and their approaches, no surveys yet made have been so minute in their examination of the bottom as to make it certain that all dangers have been found. The fulness or scantiness of the soundings is another method of estimating the completeness of a chart. When the soundings are sparse or unevenly distributed, it may be taken for granted that the survey was not in great detail.

It appears to be insufficiently realized that the degree of reliance which may reasonably be placed upon an Admiralty chart, even in surveys of modern date, is mainly dependent on the scale on which the survey was made. The scale for publication is now generally that of the original survey, except in the case of Coast sheets, which are sometimes reduced. It should not, therefore, be assumed that the original survey was made on a larger scale than that published.

It must be borne in mind that the only method of ascertaining the inequality of the bottom of the sea is by the laborious process of sounding, and that in sounding over any area, the boat or vessel obtaining the soundings is kept on given lines; that each time the lead descends it only ascertains the depth of water over an area equal to the diameter of the lead, that is about two inches, and that consequently each line of soundings, though miles in length, is only to be considered as representing a width of two inches.

Surveys are not made on equal scales, but each survey is made on a scale commensurate with its apparent importance. For instance, a general survey of a coast which vessels only pass in proceeding from one place to another is not usually made on a scale larger than one inch to the nautical mile, whilst surveys of areas where vessels are likely to anchor, are made on a scale of three inches to the mile, and surveys of frequented ports, or harbours likely to be used by Fleets, on a scale of from six inches to ten inches to the nautical mile.

Close examination by sounding is the only method by which surveys on a large scale can be made, and in view of the vast mileage of surveys yet requiring completion in the interests of navigation, it would be a waste of time to undertake large Coast surveys.

The scale on which a survey is to be conducted having been settled, it is manifestly superfluous to obtain more lines of soundings than can be represented on the paper. 100 soundings, which is the maximum number that can be placed with clearness on every square inch of paper, means that on a scale of one inch to the mile each sounding on the chart occupies an area representing eight acres of actual ground, whilst on a scale of six inches to the mile each sounding represents an area of a little less than a quarter of an acre, *i.e.*, of 100 feet square.

The following diagram represents as many soundings as can be placed legibly on a square inch of paper :—

16	15	15	13	13	14	12	11	10	9
14	15	14	14	13	13	12	11	9	8
15	15	14	17	16	14	13	10	10	9
16	16	17	16	16	12	11	8½	9	10
18	17	15	12	9	7½	7½	7½	9	10
19	16	12	9	5½	4½	5½	6½	8½	9
22	19	16	10	5½	5½	6½	7½	8½	10
20	16	12	7½	5½	6½	6½	7½	8½	10
16	15	11	9	7½	7	7½	8½	10	11
20	17	14	11	12	10	9	10	11	13

Little assistance in detecting excrescences on the bottom is afforded by the eye, even in clear water, on account of the observer being within

five feet of the surface, none in turbid seas. If there is no inequality in the soundings to cause suspicion, a patch between two lines may occasionally escape detection.

Lines of soundings plotted as close as may be practicable on a scale of 6 inches to the mile would be 100 feet apart, and each line would be only 2 inches in actual width.

Thus, in a chart on a scale of 1 inch to the mile, an inequality of some acres in extent rising close to the surface, if it happened to be situated between two lines, might escape the lead; whilst in a chart on a scale of 6 inches, inequalities as large as battleships, if lying parallel to, and between the lines of soundings, might exist without detection if they rose abruptly from an otherwise even bottom.

General Coast charts should not, therefore, be looked upon as infallible, and a rocky shore should on no account be approached within the contour line of 10 fathoms, without taking every precaution to avoid a possible danger; and even with surveys of harbours on a scale of 6 inches to the mile, vessels should avoid, if possible, passing over charted inequalities in the ground, as some isolated rocks are so sharp that the lead will not rest on them.

Blank spaces among soundings mean that no soundings have been obtained in these spots. When the surrounding soundings are deep it may with fairness be assumed that in the blanks the water is also deep; but when they are shallow, or it can be seen from the rest of the chart that reefs or banks are present, such blanks should be regarded with suspicion. This is especially the case in coral regions and off rocky coasts, and it should be remembered that in waters where rocks abound it is always possible that a survey, however complete and detailed, may have failed to find every small patch.

A wide berth should therefore be given to every rocky shore or patch, **and this rule should be invariably followed, viz., that instead of considering a coast to be clear unless it is shown to be foul, the contrary should be assumed.**

2. *Fathom Lines a Caution.*—Except in plans of harbours that have been surveyed in detail, the five-fathom line on most Admiralty charts is to be considered as a caution or danger line against unnecessarily approaching the shore or bank within that line, on account of the possibility of the existence of undiscovered inequalities of the bottom, which nothing but an elaborate detailed survey could reveal. In general surveys of coasts or of little frequented anchorages, the necessities of navigation do not demand the great expenditure of time required for such a detailed survey. It is not contemplated that ships will approach the shores in such localities without taking special precautions.

The ten-fathom line is, on rocky shores, as before mentioned, another warning, especially for ships of heavy draught.

Charts where no fathom lines are marked must be especially regarded with caution, as it generally means that soundings were too scanty and the bottom too uneven to enable them to be drawn with accuracy.

Isolated soundings, shoaler than surrounding depths, should always be avoided, especially if ringed round, as there is no knowing how closely the spot may have been examined.

3. *Chart on largest scale always to be used.*—It sometimes happens that, from press of work, only the copper plate of the larger scale chart of a particular locality can at once receive any extensive re-arrangement of coastline or soundings. This is an additional reason, besides the obvious one of the greater detail shown, why this largest scale chart should always be used for navigating.

4. *Caution in using Small Scale Charts.*—In approaching the land or dangerous banks, regard must always be had to the scale of the chart used. A small error in laying down a position means only yards on a large scale chart, whereas on a small scale the same amount of displacement means large fractions of a mile. This is particularly to be observed when coming to an anchor on a narrow ledge of convenient depth at some distance from the shore.

For the same reason bearings to objects near should be used in preference to objects farther off, although the latter may be more prominent, as a small error in bearing or in laying it down on the chart has a greater effect in misplacing the position the longer the line to be drawn.

5. *Distortion of Printed Charts.*—The paper on which charts are printed has to be damped. On drying distortion takes place from the inequalities in the paper, which greatly varies with different paper and the amount of the original damping; but it does not affect navigation. It must not, however, be expected that accurate series of angles taken to different points will always exactly agree, when carefully plotted upon the chart, especially if the lines to objects be long. The larger the chart the greater the amount of this distortion.

6. *Buoys.*—It is manifestly impossible that any reliance can be placed on buoys always maintaining their exact position. Buoys should therefore be regarded as warnings and not as infallible navigating marks, especially when in exposed positions; and a ship should always, when possible, be navigated by bearings or angles of fixed objects on shore and not by buoys.

Gas Buoys.—The lights shown by gas buoys cannot be implicitly relied on, as, if occulting, the apparatus may get out of order, or the light may be altogether extinguished. These lights in the British islands are from 10 to 50 candle power.

7. *Lights.*—Circles drawn on charts round a light are not intended to give information as to the distance at which it can be seen, but solely indicate, in the case of lights which do not show equally in all directions, the bearings between which the variation, or visibility, or obscuration of the light occurs.

All the distances given in the Light Lists and on the charts for the visibility of lights are calculated for a height of an observer's eye of 15 feet. The table of distances visible due to height at the end of each Light List affords a means of ascertaining how much more or less the light is visible should the height of the bridge be more or less. The glare of a powerful light is often seen far beyond the limit of visibility of the actual rays of the light, but this must not be confounded with the true range. Again, refraction may often cause a light to be seen farther than under ordinary circumstances.

When looking out for a light at night, the fact is often forgotten that from aloft the range of vision is much increased. By noting a star immediately over the light a very correct bearing may be afterwards obtained from the standard compass.

The intrinsic power of a light should always be considered when expecting to make it in thick weather. A weak light is easily obscured by haze, and no dependence can be placed on its being seen.

The power of a light can be estimated by remarking its order, as given in the Light Lists, and in some cases by noting how much its visibility in clear weather falls short of the range due to the height at which it is placed. Thus, a light standing 200 feet above the sea, and only recorded

as visible at 10 miles in clear weather, is manifestly of little brilliancy, as its height would permit it to be seen over 20 miles, if of any power. (*See* table in Light List before mentioned.)

The distance from a light cannot be estimated either by its brilliancy or its dimness.

8. *Fog Signals.*—Sound is conveyed in a very capricious way through the atmosphere. Apart from wind, large areas of silence have been found in different directions and at different distances from the fog signal station, in some instances even when in close proximity to it. The apparatus, moreover, for sounding the signal often requires some time before it is in readiness to act. A fog often creeps imperceptibly towards the land, and is not observed by the people at a station until it is upon them; whereas a ship may have been for many hours in it, and approaching the land. In such a case no signal may be made. When sound has to travel against the wind, it may be thrown upwards; in such a case, a man aloft might hear it when it is inaudible on deck. Under certain conditions of the atmosphere, when a fog signal is a combination of high and low notes, one of the notes may be inaudible.

The mariner should not assume—

a. That he is out of hearing distance, because he fails to hear the sound.

b. That because he hears a fog signal faintly, that he is at a great distance from it.

c. That he is near it, because he hears the sound plainly.

d. That the distance from and the intensity of the sound on any one occasion, is a guide to him for any future occasion.

e. That the fog signal has ceased sounding, because he does not hear it even when in close proximity.

Taken together, these facts should induce the utmost caution in closing the land in fogs. The lead is generally the only safe guide.

9. *Tides and Tidal Streams.*—In navigating coasts where the tidal range is considerable, caution is always necessary. It should be remembered that there are indraughts to all bays and bights, although the general run of the stream may be parallel to the shore.

The turn of the tidal stream off shore is seldom coincident with the time of high and low water on the shore. In open channels, the tidal stream ordinarily overruns the turn of the vertical movement of the tide by about three hours, forming what is usually known as tide and half-tide, the effect of which is that at high and low water by the shore the stream is running at its greatest velocity.

In crossing a bar or shallow flats, the table (B) at page 146 of the Tide Tables will be found of great assistance in calculating how much the water has risen or fallen at any hour of the tide.

On coasts where there is much diurnal inequality in the tides, the amount of rise and fall can never be depended upon, and additional caution is necessary.

It should also be remembered that at times the tide falls below the level of low-water ordinary springs. This always occurs on the coasts of Europe at the equinoxes, but in other parts of the world, and especially in the tropics, such periodic low tides may coincide more frequently with the solstices. Wind or a high barometer may produce it at any time, and the amount varies with locality. When the moon's perigee coincides with the full or new moon the same effect is often produced.

10. *Arrows* on charts only show the most usual or the mean direction of a tidal stream or current. It must never be assumed that the direction

of a stream will not vary from that indicated by the arrow. In the same manner, the rate of a stream constantly varies with circumstances, and the rate given on the chart is merely the mean of those found during the survey, possibly from very few observations.

11. *Fixing Position.*—The most accurate method of fixing a position relative to the shore is by angles between well-defined objects on the chart. All ships are supplied with a station-pointer, and this method should be used whenever possible.

Two things are, however, necessary to its successful employment. First, that the objects be well chosen; and, second, that the observer is skilful and rapid in his use of the sextant.

For the former, reference can be had to the pamphlet on the use of the station-pointer, which is in every chart box; the latter is only to be obtained by practice.

It will readily be seen that in war time, when the compass may be knocked away, or rifle-fire may make it undesirable to expose the person more than necessary, a sextant offers great advantages, as angles can be obtained from any position whence the objects are visible. It is this contingency that makes it especially desirable that all navigating officers should become expert in this method of fixing a ship's position.

In many narrow waters also, where the objects may yet be at some distance, as in coral harbours or narrow passages among mud banks, navigation by sextant and station-pointer is invaluable, as a true position can only be obtained by its means. A small error in either taking or plotting a bearing under such circumstances may put the ship ashore.

It is not intended that the use of the compass to fix the ship should be given up; there are many circumstances in which it may be usefully employed, but errors more readily creep into a position so fixed. In all cases where great accuracy of position is desired, angles should invariably be used, such as the fixing of a rock or shoal, or of additions to a chart, as fresh soundings or new buildings. In all such cases angles should be taken to several objects, the more the better; but five objects is a good number, as the four angles thus obtained not only prevent any errors, but they at once furnish a means of checking the accuracy of the chart itself. In the case of ordinary soundings, it is only necessary to take a third angle now and then; firstly, to check the general accuracy of the chart as above stated; secondly, to make certain that the more important soundings, as at the end of a line, are correctly placed.

Sometimes, when only two objects are visible, a compass bearing and sextant angle may be used with advantage.

In passing near a point of land, or an island, the method of fixing by doubling the angle on the bow is invaluable. The ordinary form of it, the so-called "four-point bearing," when the bearing is taken four points on the bow, and on the beam, the distance from the object at the latter position being the distance run between the times of taking the two bearings, allowing for current, gives an excellent fix for a departure, but does not ensure safety, as the point, and probably the rocks off it, are abeam before the position is obtained.

By taking the bearings of two points and four points on the bow, a very good position is obtained before the object is passed; the distance of the latter at the second position being, as before, equal to the distance run in the interval, allowing for current.

This is, however, only strictly true, if the current is directly with or against the course of the ship. If a cross current has to be allowed for, the results by this method may be altogether erroneous and misleading. The following example shows in a tabular form the errors that might be produced by accepting the distance run in the interval, allowing for current, as the distance of the object at time of second bearing.

Example: A vessel steering East sights a light bearing E.N.E., or two points on the bow; one hour after, having run in the interval 10 miles by log, the light bears N.E., *i.e.*, she has doubled the angle on the bow. Current, in all cases, at the rate of 2 miles an hour.

Direction of Current.	Distance run between 1st & 2nd Bearings.		Distance of Light at 2nd Bearing.	Direction of Current.	Distance run between 1st & 2nd Bearings		Distance of Light at 2nd Bearing.
	By Log.	Allowing for Current.			By Log.	Allowing for Current.	
	Miles.	Miles.	Miles.		Miles.	Miles.	Miles.
East -	10	12	12	West -	10	8	8
E.N.E. -	10	11·8	10	W.S.W. -	10	8·2	10·2
N.E. -	10	11·4	8	S.W. -	10	8·7	11·9
N.N.E. -	10	11	6·2	S.S.W. -	10	9·4	13·6
North -	10	10·2	5·3	South -	10	10·2	14·7
N.N.W. -	10	9·4	4·9	S.S.E. -	10	11	15
N.W. -	10	8·7	5·3	S.E. -	10	11·4	14·7
W.N.W. -	10	8·2	6·1	E.S.E. -	10	11·8	13·8

A table of factors, by which to multiply the distance run, to obtain the distance of the object when any number of degrees between the two bearings has been observed, is now supplied in all chart boxes.

The use of a danger angle in passing outlying rocks with land behind should also not be forgotten. In employing this method, however, caution is necessary, as should the chart be not accurate, *i.e.*, should the objects selected be not quite correctly placed, the angle taken off from it may not serve the purpose. It should not, therefore, be employed when the survey is old or manifestly imperfect.

In fixing by the compass, it must always be remembered that two bearings only are liable to error. An absolute error may be made in either bearing observed; errors may be made in applying the deviation; or errors may creep in in laying them on to the chart. For these reasons, a third or check bearing of some other object should be taken, especially when near the shore or dangers. The coincidence of these three lines will prevent any mistakes.

Amongst astronomical methods of fixing a ship's position, attention is drawn to the great utility of Sumner's method. A Sumner line, that is, a line drawn through the position (obtained by an assumed latitude and longitude by chronometer) at right angles to the bearing of the sun, as obtained from the azimuth tables, gives at times invaluable information, as the ship must be somewhere on that line provided the chronometer is correct. A deep cast of the lead at the same time may often serve to get an approximate position on the line. An early and very accurate position can be also obtained by Sumner's method, by getting a longitude by a bright star at daylight when the horizon is well visible, and another longitude by the sun when a few degrees above the horizon, or by observing two or more stars at twilight. The Sumner lines drawn through the two positions thus obtained will, if the bearing of sun and star differ three points or more, give an excellent result.

12. *Change of Variation of the Compass.*—The gradual change in the variation must not be forgotten in laying down positions by bearing on charts. The magnetic compasses placed on the charts for the purpose of facilitating plotting become in time slightly in error, and in some cases, such as with small scales, or when the lines are long, the displacement of

position from neglect of this change may be of importance. The compasses are re-engraved when the error amounts to a quarter of a point, but the chart plates cannot be corrected more frequently from the impossibility of making alterations too often on one spot in a copper plate.

The geographical change in the variation is in some parts of the world sufficiently rapid to need consideration. For instance, in approaching Halifax from Newfoundland the variation changes 10° in less than 500 miles. The variation chart should be consulted on this head.

13. *Local Magnetic Disturbance of the Compass on board Ship.*—The term "local magnetic disturbance" has reference only to the effects on the compass of magnetic masses external to the ship in which it is placed. Observation shows that disturbance of the compass in a ship afloat is experienced only in a few places on the globe.

Magnetic laws do not permit of the supposition that it is the visible land which causes such disturbance, because the effect of a magnetic force diminishes in such rapid proportion as the distance from it increases that it would require a local centre of magnetic force of an amount absolutely unknown to affect a compass half a mile distant.

Such deflections of the compass are due to magnetic minerals in the bed of the sea under the ship, and when the water is shallow, and the force strong, the compass may be temporarily deflected when passing over such a spot, but the area of disturbance will be small, unless there are many centres near together.

It is very desirable that whenever a ship passes over an area of local magnetic disturbance, the position should be fixed, and the facts reported as far as they can be ascertained.

14. *Use of Oil for Modifying the Effect of Breaking Waves.*—Many experiences of late years have shown that the utility of oil for this purpose is undoubted, and the application simple.

The following may serve for the guidance of seamen, whose attention is called to the fact that a very small quantity of oil, skilfully applied, may prevent much damage both to ships (especially the smaller classes) and to boats, by modifying the action of breaking seas.

The principal facts as to the use of oil are as follows:—

1. On free waves, *i.e.*, waves in deep water, the effect is greatest.

2. In a surf, or waves breaking on a bar, where a mass of liquid is in actual motion in shallow water, the effect of the oil is uncertain, as nothing can prevent the larger waves from breaking under such circumstances; but even here it is of some service.

3. The heaviest and thickest oils are most effectual. Refined kerosene is of little use; crude petroleum is serviceable when nothing else is obtainable; but all animal and vegetable oils, such as waste oil from the engines, have great effect.

4. A small quantity of oil suffices, if applied in such a manner as to spread to windward.

5. It is useful in a ship or boat, both when running, or lying to, or in wearing.

6. No experiences are related of its use when hoisting a boat up in a sea-way at sea, but it is highly probable that much time and injury to the boat would be saved by its application on such occasions.

7. In cold water, the oil, being thickened by the lower temperature, and not being able to spread freely, will have its effect much reduced. This will vary with the description of oil used.

8. The best method of application in a ship at sea appears to be: hanging over the side, in such a manner as to be in the water, small canvas bags, capable of holding from one to two gallons of oil, such bags being pricked with a sail needle to facilitate leakage of the oil.

The position of these bags should vary with the circumstances. Running before the wind they should be hung on either bow—*e.g.*, from the cathead—and allowed to tow in the water.

With the wind on the quarter the effect seems to be less than in any other position, as the oil goes astern while the waves come up on the quarter.

Lying to, the weather bow and another position farther aft seem the best places from which to hang the bags, with a sufficient length of line to permit them to draw to windward, while the ship drifts.

9. Crossing a bar with a flood tide, oil poured overboard and allowed to float in ahead of the boat which would follow with a bag towing astern, would appear to be the best plan. As before remarked, under these circumstances the effect cannot be so much trusted.

On a bar with the ebb tide it would seem to be useless to try oil for the purpose of entering.

10. For boarding a wreck, it is recommended to pour oil overboard to windward of her before going alongside. The effect in this case must greatly depend upon the set of the current, and the circumstances of the depth of water.

11. For a boat riding in bad weather from a sea anchor, it is recommended to fasten the bag to an endless line rove through a block on the sea anchor, by which means the oil is diffused well ahead of the boat, and the bag can be readily hauled on board for refilling if necessary.

IN THIS WORK THE BEARINGS ARE ALL MAGNETIC, EXCEPT WHERE MARKED AS TRUE.

THE LATITUDES AND LONGITUDES GIVEN IN THE TEXT ARE APPROXIMATE.

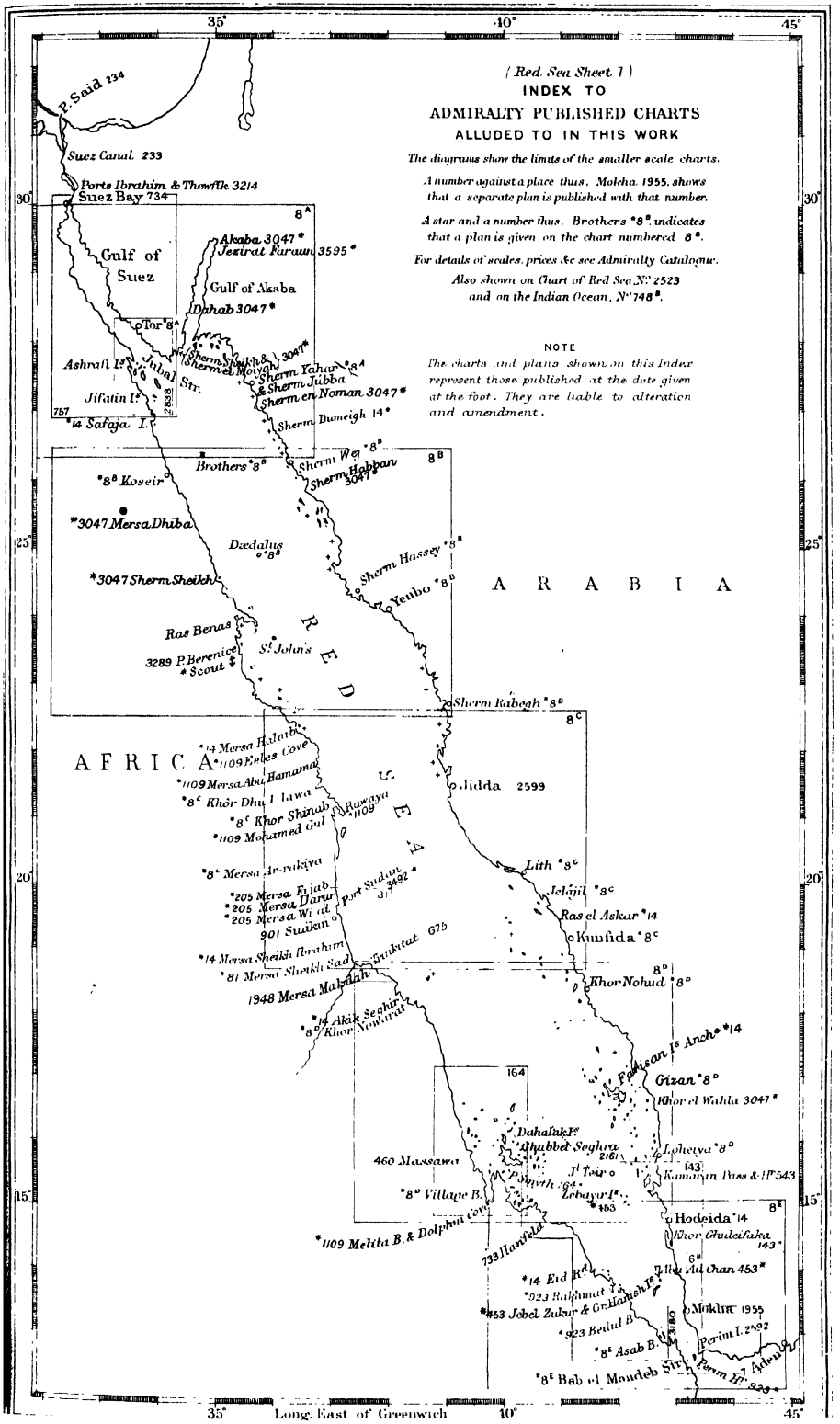
THE VARIATION GIVEN ON EACH PAGE IS FOR THE YEAR 1908.

THE BEARINGS OF THE LIMITS OF VISIBILITY OF ARCS OF LIGHTS ARE FROM SEAWARD OR TOWARD THE LIGHT.

THE DISTANCES ARE EXPRESSED IN SEA MILES OF 60 TO A DEGREE OF LATITUDE.

A CABLE'S LENGTH IS ASSUMED TO BE EQUAL TO 100 FATHOMS.

THE SOUNDINGS ARE REDUCED TO LOW WATER OF ORDINARY SPRING TIDES.


(Red Sea Sheet 1)
INDEX TO
ADMIRALTY PUBLISHED CHARTS
ALLUDED TO IN THIS WORK
The diagrams show the limits of the smaller scale charts.
A number against a place thus, Moksha 1955, shows that a separate plan is published with that number.
A star and a number thus, Brothers *8B, indicates that a plan is given on the chart numbered 8B.
For details of scales, prices &c see Admiralty Catalogue.
Also shown on Chart of Red Sea No. 2523 and on the Indian Ocean, No. 748B.
NOTE
The charts and plans shown on this Index represent those published at the date given at the foot. They are liable to alteration and amendment.
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Suez Canal 233
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Suez Bay 734
Gulf of Suez
Akaba 3047 *
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Gulf of Akaba
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Jifatin Is
757
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Sherm Sheikh & Shermet Moiyah 3047 *
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Sherm Jubba
Sherm en Noman 3047 *
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*1109 Mersa Abu Hamama
*8C Khor Dhul Iawa
*8C Khor Shinab
*1109 Mohamed Gul
Rawaya *1109
*8C Mersa Ar-rukiya
*205 Mersa Fijab
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Port Sudan 3492 *
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Fatison Is Anch *14
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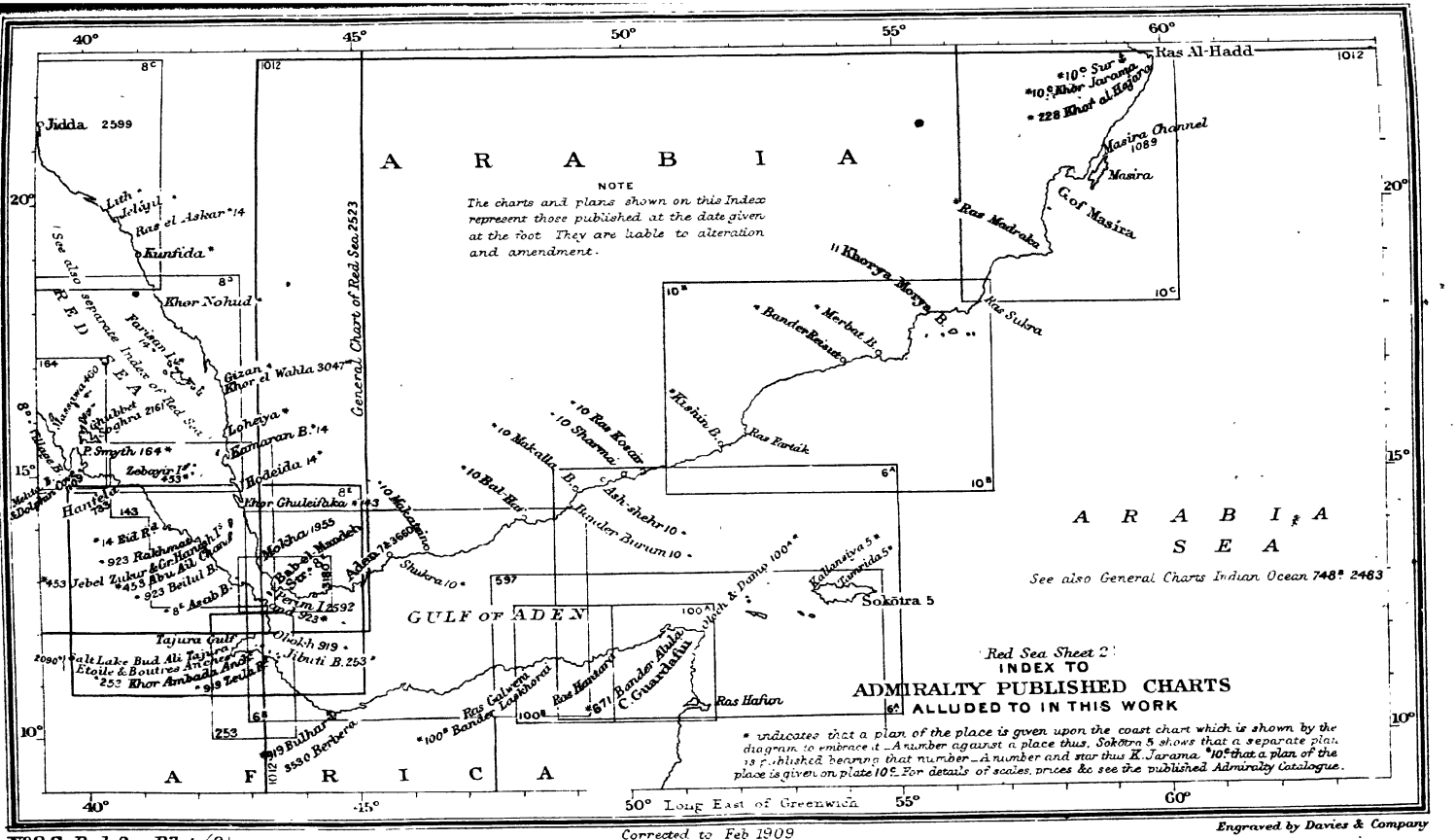
Khor el Wahla 3047 *
Dahalak Is
Shubbet Seghra
Lpheiya *8C
Kamaran Pass & Hr 543
460 Massawa
Jl Toir
Zebayr I.
*8C Village B.
*1109 Melita B. & Dolphin Cove
733 Hanfela
Hodeida *14
Khor Ghuleifiqa
Jl Hodeida Chan 453 *
*14 Eid Rd
*923 Balhannat Is
Hanish Is
*453 Jebel Zukar & Gr Hanish
Mokha 1955
*923 Beilul B.
*8E Asab B.
Perim I. 2592
Perim Hr.
Aden
*8E Bab el Mandeb Str.
35°
40°
45°
30°
25°
20°
15°
Long. East of Greenwich



Corrected to Feb 1909

Engraved by Davies & Company

For the details of sectors, and the latest information respecting the lights described in this volume, the mariner is referred to the Admiralty List of Lights, Part VI.

This List is published early in the current year, corrected to the preceding 31st December.

x (3)54627.

THE

RED SEA AND GULF OF ADEN PILOT.

CHAPTER I.

GENERAL REMARKS ON THE RED SEA AND GULF OF ADEN.—STANDARD TIME.—COMMUNICATION.—DOCKS AND REPAIRS.—COAL.—WINDS AND WEATHER.—CYCLONES.—TIDES.—CURRENTS.—BAROMETER.—TEMPERATURE.—CLIMATE.—PASSAGES.

GENERAL REMARKS.—The Red Sea and Gulf of Aden Pilot contains descriptions of the Suez canal, the Red sea, the Gulf of Aden, including the island of Sokótra to the south-eastward, and the coast of Arabia as far eastward as the entrance of the Gulf of Omán.

CHARTS.—The impetus given to the navigation of the Red sea as the great highway between west and east by the opening of the Suez canal caused the value and amount of traffic to outrun the hydrographic knowledge desirable in so frequented a region. The mariner is, therefore, cautioned to use extra care when consulting the charts, bearing in mind that fresh knowledge is constantly being acquired, and though the latest charts are the best at the time obtainable, many are constructed from old surveys, conducted under great difficulties, and with appliances far inferior to those now in use. Every Admiralty chart bears on its face its date and history, and it may be assumed that those published from surveys made by His Majesty's ships since the date of the opening of the Suez canal, or during the last forty years, are fairly correct, whilst the accuracy of those of an earlier date should not be implicitly relied on. Also, that, whilst every care is taken to insure accuracy in the positions of reefs bordering on the central track, the maze of reefs lying between that track and the shore on either hand can still only be considered as roughly laid down.

Chart 2523. Red Sea.

RED SEA.—This extensive inland sea lies between the parallels 30° N. and 12° 40′ N., and between the meridians 32° 20′ E. and 43° 25′ E. From Suez to Cape Bab-el-Mandeb

Chart 2523. Red Sea.

it is about 1,200 miles long, in a south-south-east direction; and its greatest breadth from shore to shore, at right angles to its axis, is in the southern part near Massawa, where it is 190 miles wide; its least breadth, in the Straits of Bab-el-Mandeb, is 14 miles.

Chart 157. Gulf of Suez.

The northern part of this sea bifurcates; one branch, the Gulf of Suez, has a general north-north-west and opposite direction throughout its length, which is about 170 miles; the other, the Gulf of Akaba, has a north-north-east direction, and is about 97 miles long. On the promontory between these gulfs, the Sinai peninsula, is the mountain group of Jebel Musa, which includes Mounts Sinai and Horeb. No rivers discharge themselves into the Red sea, and the northern half of the region is in the rainless district.

Chart 2523. Red Sea.

Coral reefs.—The Red sea, though, generally speaking, of considerable depth (in some places over 1,000 fathoms), is in parts studded with rocky islets and hidden coral banks extending far into the main ship channel. They are more numerous in the southern than in the northern portion of the sea, the principal being the Farisan group, the Dahalak group, the Zebayir, and the Hanish islands.

In the Red sea they are, perhaps, more numerous and extensive than in any other body of water of equal size, extending most commonly in long strips parallel with the shore, with which they are in many cases united. They are usually not more than 5 feet below the surface, but the sea seldom breaks on them, and their outer edges are generally very steep-to.

In the Gulf of Suez, they are generally only 2 or 3 feet below the surface, and in the summer, when the level of the sea is at its lowest, they occasionally uncover; the light green tint of the water on them makes them almost always plainly visible from the masthead, except with the sun ahead or when the glassiness of the water in a dead calm prevents any reef being seen. With the slightest ripple these shallow reefs always break on the weather side.

Among the Red sea reefs unconnected with the shore, several are at some distance from it, but with channels between them and it of sufficient depth to admit of navigation by small vessels, and under their lee good anchorage may often be obtained. These reefs are more numerous on the eastern than on the western shore; but the Dahalak bank (*Lat. 16° 0′ N., Long. 40° 15′ E.*) is, perhaps, more extensively intersected by channels than any other part of this sea. There are also many isolated

Chart 2523. Red Sea.

reefs, but they are not so formidable as might be supposed, in consequence of the transparency of the water, which admits of their being easily seen from aloft. They therefore offer no considerable obstacle to navigation by day, and the shelter afforded by some of them during strong head winds often renders them very useful.

The water outside the reefs, especially when moved by tidal streams or storms, is often of a milky appearance, caused by the coral sand then stirred up. This white water frequently indicates a shoal, but not always, for some reefs show as dark green patches. This is the case at Jidda; and the precaution is then necessary of having the sun astern of the vessel, which, indeed, is the secret of successful navigation in all coral waters.

Central and Inner channels.—The existence of the islands and reefs just mentioned has led to a division of the Red sea into a central and two inshore channels. The central, and, for all practical purposes, only navigable channel used by full-power steam-vessels bound through the Red sea, lies between the outer extremes of the reefs extending from either shore, and has a depth of over 1,000 fathoms in the centre abreast of Cape Elba, but shoals towards either end of the sea. The breadth of this channel in its widest part, near the Siyal islands, is about 110 miles; farther southward it decreases to little more than 40 miles, and from thence gradually narrows as the straits of Bab-el-Mandeb are approached.

The inner channel on the Arabian side is formed partly by small detached reefs and sunken rocks, and partly by islands and long reefs. The general width of this inner channel is from 2 to 3 miles; the depth is considerable, and the anchorage, except in the places hereinafter described, is so insecure as to afford but little protection. The inner channel on the western coast is similar in character to that on the eastern coast, but much narrower. The harbours, of which there are several, furnish fair anchorage; but it is unsafe to anchor on the rocky shelves projecting from the reefs. Both of these in-shore channels are connected with the central channel by openings in the reefs, some of which, especially those northward of latitude 17° N., are of great width.

Mountains.—The land adjacent to the Red sea, as well as to the Gulf of Aden, is generally mountainous throughout its whole extent, though the high lands seldom abut on the shores, which latter are generally low and sandy; indeed, the Red sea may be considered as the lower part of a valley, bounded eastward by the high table-land of Arabia, and westward by a range of mountains rising from 4,000 to 6,000 feet in height.

Chart 2523. Red Sea.

Between these high grounds and the shore is a level district of some extent, generally destitute of vegetation. The condition of the people dwelling in the villages bordering on the Red sea is said to be wretched and degrading in the extreme.

Territorial limits, &c.—The Arabian side of the Red sea consists of the Turkish provinces of Hedjaz in the north and Yemen in the south. Yemen is perhaps, the most fertile part of Arabia. The boundary between Turkish and Egyptian territory commencing from a point 4½ geographical miles westward of Marashesh, the north-eastern extreme of the Gulf of Akaba, extends in almost a straight line to Rasah on the Mediterranean seaboard. The Sinai peninsula, therefore, with a large extent of territory eastward of the Suez canal, together with the western shore of the Red sea as far as Ras Kasar, the southern boundary of Nubia, in lat. 18° 2½′ N., is Egyptian dominion.

A desert extends between the Red sea and the Nile valley. Territory geographically Abyssinian, as it abuts on the mountains of that country, commences in lat. 18° N. and continues southward beyond the entrance to the Red sea; practically, these coast lands belong to the several native tribes inhabiting them, who have never submitted to any foreign authority except when compelled to do so by superior force; Italy has, however, by treaty, assumed a protectorate over this part of the coast as far south as Ras Dumeira, in lat. 12° 43′ N., and has formed settlements at Massawa, Asab, and one or two adjacent places.

Southward of Ras Dumeira, France has a protectorate over the western Red sea littoral.

Principal ports.—The principal trading and other ports on the western coast at present are Suez, Suákin, Khor Nowarat, and Massawa; but, Port Súdan, about 30 miles northward of Suákin, being the terminus of the new Súdan railway, will probably develop into a port of great importance in a very short time. On the eastern coast are Yembo, Jidda, Hodeida, and Mokha. An active intercourse is maintained between the inhabitants of the opposite shores, more particularly as the Red sea is crossed by the African pilgrims on their way to Mecca and Medina; and trade, which for years was almost paralysed by the incessant tribal wars and insurrections of the Súdan regions, may be expected to revive under the more settled conditions now prevailing. The number of pilgrims from Africa alone is said to average 20,000 annually. Jidda, distant from Mecca 60 miles, in a westerly direction, is the principal landing place for the pilgrims.

Chart 2523. Red Sea.

The harbour of Kamarán is also of importance, as, being the quarantine station for the Turkish ports, it is often full of shipping during the pilgrim season, or in times of epidemic.

Charts 6a, 6b. Gulf of Aden.

GULF of ADEN.—Passing from the Red sea through the Straits of Bab-el-Mandeb into the Gulf of Aden, the axis or central line of that gulf is found to assume a direction nearly at right angles to that of the Red sea. Its width in the western part, between Aden on the north and Ras Khanzir on the south, is 123 miles, increasing to nearly 180 miles in the eastern part ; and its length from the entrance of the Gulf of Tajura in the west to abreast of Ras Asír or Cape Guardafui in the east, is about 450 miles, or to a line drawn from Ras Fartak in Arabia to the eastern end of Sókotra, not less than 600 miles.

The Gulf of Aden resembles the Red sea in the entire absence of rivers or streams of the slightest importance on either shore, and also in the great depth of its waters, in which latter respect it far exceeds the Red sea, the central half of the gulf being generally more than 1,000 fathoms, and frequently approaching 1,500 fathoms.

From the Straits of Bab-el-Mandeb, the western and southern shores of the Gulf of Aden at first take a southerly direction for about 30 miles to the entrance of the Gulf of Tajura, which gulf recedes about 55 miles westward from Ras al Bir at its entrance; here, and around the gulf, the hills approach the coast, which is, in many places, precipitous. Southward and eastward of the Gulf of Tajura, the coast is low and sandy as far as Berbera, the mountains receding some 15 or 20 miles from the coast. In the neighbourhood of Berbera, however, they again approach it, and from thence eastward the land is moderately high, the coastal hills ranging from 500 to 1,000 feet, and being backed by limestone mountains and the Jebel Warsangali ranges, from 6,000 to 7,000 feet in height. The region of these mountains produces frankincense, gums, &c., and the climate is said to be most invigorating, the natives retreating to them from the coast during the South-west monsoon period, when the heat at times is insufferable.

The French have settlements at Obokh and Jibuti, just within both sides of the entrance of the Gulf of Tajura; these with Zeila and Berbera, under British protection, are the only harbours on the western and southern coasts; but, with the exception of the outlying reefs in the approaches to and southward of Zeila, the shore everywhere may be safely

Charts 6a, 6b. Gulf of Aden.

approached, and, during fine weather, anchorage may be found off any of the trading places, in moderate depths of water. Trade on this coast is chiefly confined to the North-east monsoon period, October to March.

The northern shore of the Gulf of Aden being the southern coast of Arabia, is principally a wide sandy plain, bordered in the distance by high mountain ranges, dreary and unproductive, with scarcely a patch of verdure to relieve the eye or break the monotony of the view. In some parts of this coast the mountains approach the sea, as in the province of Aden; also at Ras Fartak, a cape which is uninterruptedly perpendicular for a distance of 6 miles and attains a height of 2,500 feet. Ras Sakar, farther eastward, is a similar cape and is visible in clear weather 60 miles distant; these are both conspicuous landmarks.

Aden is the only harbour of importance on the northern shore of the gulf; under favourable circumstances it admits vessels of 26 feet draught at low water. Aden and Perim are the principal coaling stations at the entrance of the Red Sea for steamers trading to the East and Australia.

Masira channel, within Masira island, about 150 miles south-westward of Ras Al-Hadd, affords sheltered anchorage for vessels of moderate draught, but the channel is somewhat intricate. With the exception of the coast between Cape Bab-el-Mandeb and Aden, and the approaches to the Gulf of Masira, there are but few outlying dangers, and temporary anchorage may be taken up under the lee of most of the prominent capes.

Standard time.—The standard time of the meridian of 30° E. from Greenwich, or 2 hours fast on Greenwich mean time, has been adopted throughout Egypt. Aden mean time is 3h. 0m. 19·3s. fast on Greenwich mean time, and Aden mean time is observed throughout British Somaliland.

Lloyd's signal stations.—Lloyd's signal stations are established at Port Said, Suez, Perim, and Aden, with all of which places communication may be had by International code, and messages forwarded by telegraph; they are also fitted with wireless telegraph appliances.

Communication.—The importance of the Red sea and Gulf of Aden as a highway causes the means of communication to be far in excess of what might be expected, every little port being frequently visited by steam-vessels.

Chart 1188. The World (Coal and Telegraphs).

Telegraph cables.—Telegraphic communication, chiefly by the submarine cables of British companies, has also been carried to a high state of perfection. Thus, from Suez are laid four cables connecting it directly with Suákin, Perím, Obokh, and Aden; and from the latter are three cables connecting it with Bombay and one with Zanzibar, and from thence to Seychelles and Mauritius; two from Zanibar to Mozambique, and from thence one to Natal and Cape Colony.

In addition to these are two foreign cables, the first crossing the Red sea from Suákin to Jidda, the second connecting Massawa, Asab, Perim, and Obokh.

Land lines.—An Egyptian Government telegraph line connects Suez with the Quarantine stations of Abu Zenime and Tor. With the exception of a wire between Koseir and Suez, for native messages only, and a line between Suákin and Port Sudan, there is, as yet, no telegraph by land on the western shore of the Red sea southward of the Gulf of Suez, nor does any land line exist in any part of the Gulf of Aden; but lines are laid from Suákin to the Atbara, where they join the inland Egyptian system; and from Suakin and Trinkitat, to Tokar, Kassala, Suk-abu-Sin, and Massawa.

From Jibuti, in the Gulf of Tajura, a line is open to Harrar, about 150 miles inland; also to Addis Ababa, and from thence to Massawa, *viâ* Asmara.

On the eastern shore, Jidda is in telegraphic communication with the Arabian towns of Medina, Mecca, and Taif; and by cable, *via* Suàkin and Perim, with Aden; also with Mokha, Hodeida, Loheiya, Kamaran, and Sana.

Railways.—In Egypt railways connect the ports of Alexandria, Rosetta, Damietta, Port Said Ismailia, and Suez, with each other and with Cairo; from Cairo a railway runs through Assiut to the Atbara and Khartum; the railway from Trinkitat to Tokar is completed; also, the new Nile and Red sea railway was publicly opened by Lord Cromer in January, 1907. As its name implies, it connects the Nile with the Red sea, and has its terminus at Port Súdan, newly created, with which place Suákin is also connected.

From Massawa, in the Italian territory, a railway, constructed for military purposes, runs inland 17 miles to Sahati.

Jibuti, the capital of the French Protectorate, in the Gulf of Tajura, is connected by railway with the city of Harrar about 150 miles inland.

NAVAL DOCKYARDS AND ESTABLISHMENTS.—No naval establishment belonging to His Majesty's Government exists within the limits prescribed by this work; the nearest available of such establishments are at Malta, Mauritius, and Bombay. Other available means for docking and repairs are as follows:—

Dry docks and repairs.—Port Said has a pontoon dock belonging to the Suez Canal Company, with a lifting capacity of about 3,000 tons; its dimensions are: length over all, 295 feet; width of entrance at high water, ordinary springs, 61 feet; depths on blocks at same time, 18 feet. There are also two patent slips with a lifting power of 300 tons each, and the cradles are 150 feet long.

There is dry dock accommodation at Suez at the head of the South basin of Port Ibrahim, 2 miles south-eastward of the town; the dock is 406 feet in length over all, with a breadth at entrance, 25¾ feet below the level of high water, and springs of 73½ feet; depth over sill 29¾ feet, depth on the blocks 23 to 26½ feet at high water, ordinary springs, at which time there are not more than 24 feet in the approach to the dock. The Khedivial Mail Steamship and Graving Dock Company are the proprietors, but they take no responsibility in the docking, and the facilities for repair, though improved of late years, by no means equal the dock accommodation.

At Aden there is a floating dock capable of taking a vessel of 750 tons, if not exceeding 185 feet in length; also a patent slip fit for small craft and launches only.

Small repairs to hull and machinery can be effected at Suez; heavy castings or machinery are obtained from Alexandria. Large repairs to boilers and machinery are carried out by the Coal Company at Perim, where also a large salvage plant is available.

At Aden, the firm of Luke Thomas & Co. undertake such moderate repairs to hull or machinery as can be effected when the small dock accommodation available here can be dispensed with, or is not sufficient for the size of the ship requiring it. Full details on these subjects will be found in the descriptions of the places named.

COAL and SUPPLIES.—The only places within the scope of this work at which supplies of coal are kept in any quantity are, Port Said, Suez, Massawa, Perim, Aden, and Jibuti, whilst at Suákin and Jidda a small stock is generally in hand. The mode of supply and general details of coaling at these ports, as also of other supplies needed by ships will be found in their proper places in the body of this volume.

Consuls and Official Agents.—British Consuls, Vice-Consuls, or Consular Agents are stationed at the following Egyptian and Turkish ports, viz.:—Port Said, Suez, Port Súdan, Suákin, Jidda, Kamarán and Hodeida. In the British Somaliland Protectorate, an acting British Consul-General is stationed at Berbara and a Vice-Consul at Zeila.

Aden, being a British possession attached to the Government of Bombay, is administered by a Political Resident; and at Perim, and other places under his authority, are stationed, as may be required, officers styled Assistants to the Political Resident.

Chart of magnetic curves 2598.

Variation of the compass.—In the present year, 1909, the variation in the Gulf of Suez is about 3° W., decreasing to 2° 30′ W., in the passage down the Red sea and to 2° W. in the Straits of Bab-el-Mandeb. In the northern part of the Red sea, it decreases 3½′ annually; as the Straits of Bab-el-Mandeb are neared, the annual decrease is still less. On the meridian of Aden, in the centre of the gulf of that name, the variation is about 1° 40′ W., whilst farther eastward, between the Arabian coast and Sokótra, on about the meridian of Ras Asír, the line of no variation is passed; eastward of which the variation becomes easterly, and slightly increasing. From the western extreme of the gulf of Tajura to the line mentioned in the eastern part of the Gulf of Aden, the variation differs only from 2° 20′ W. to zero; and as regards annual change, decreases slightly.

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WINDS.—In the season of the year when traffic is most brisk through the Red sea and Gulf of Aden, October to May, it may be stated generally that in the central channel the winds blow from north-north-west in the northern portion of the Red sea, and from south-south-east in the southern; that in the space towards which they blow there is a belt of comparatively low barometer where calms and light airs prevail, and which varies in size and oscillates in position. *See* Barometer, page 28. This period of the year corresponds with that of the North-east monsoon in the Arabian sea, including both intervals of change between it and the South-west monsoon as well as the first month of the latter.

As the North-east monsoon assumes an east or east-north-east direction in the gulf of Aden, and following the trend of the gulf, blows up from the south-eastward through the Straits of Bab-el-Mandeb, often with the force of a moderate gale, and

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especially so during the height of the monsoon; it follows, that, at this season, from the time an outward bound vessel meets the south-south-east wind in the Red sea until fairly out into the Arabian sea, she will have a head wind against her, which is frequently very strong from the vicinity of Jebel Teir until near Aden.*

During the remainder of the year—the hot season from June to September, when the South-west monsoon is blowing in the Arabian sea—the belt of comparatively low barometer before mentioned fills up and becomes obliterated, and northerly winds of variable strength prevail throughout the whole length of the Red sea, with but little interruption; whilst southward and eastward of the Straits of Bab-el-Mandeb through the Gulf of Aden, variable winds are found during the early part of this monsoon; but, from June to September, steady westerly winds prevail, blowing strongly at times out of the Red sea and through the gulf occasionally as far as Sokótra and into the strength of the South-west monsoon in the open sea. At this season, therefore, a vessel may expect a fair wind the whole distance from the Gulf of Suez to the Arabian sea.

The foregoing remarks demonstrate that whilst the winds of the Red sea largely depend upon those of the Gulf of Aden, these in turn are governed by the monsoon prevailing in the Arabian sea. This becomes the more apparent when, by the aid of the valuable information collated and compiled by the British Meteorological Office, we compare the prevailing winds of January and July, the former month being in the height of the North-east monsoon; the latter, of the South-west monsoon.

Thus, in January it is found that the northerly wind blows almost uninterruptedly from the Gulf of Suez to about lat. 23° N. and continues as the prevailing wind to about 19° N.; farther southward, the south-easterly wind prevails. From lat. 23° N. to lat. 15° N., there is a mingling of the winds from the principal directions of north and south-east; and from lat. 18° N. to 20° N., the winds from these directions are almost of equal frequency (the belt of comparatively low barometer before referred to).

In the Gulf of Aden, the wind is at this time principally from the eastward, drawing more from the northward at the

* In describing the winds ordinarily experienced, it is impossible to do more than generalise, and the mariner must expect accordingly to find occasional variations from the general facts here set forth. Thus, as one example, in January, 1884, H.M.S. *Jumna*, in proceeding southward through the Red sea, experienced southerly winds the whole of the distance from Suez to the Straits of Bab-el-Mandeb.

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eastern end, and from the south-eastward at the western end. Calms are most frequent between lat. 20° N. and Aden, but they form a very small proportion of the observations recorded. The force of the wind is rather stronger with south-easterly than with northerly winds, and the strength of a moderate or fresh gale is frequently met with between lat. 20° N. and Perim.

In July, the wind is generally northerly or north-westerly over the whole of the Red sea, drawing more westerly in the southern part, whilst in the Gulf of Aden the prevailing direction is westerly and south-westerly. The mean force of the wind is about the same throughout, but individual observations show that the force of a gale is only attained in the Gulf of Suez, and in the Gulf of Aden; stronger in the latter. Calms are about twice as numerous as in January, and now form about fifteen per cent. of the total wind observations.

THE NORTH-EAST MONSOON commences in the Arabian sea about the middle of October, and prevails during November, December, January, and February, after which the wind becomes light and variable, until the setting in of the South-west monsoon. The North-east monsoon blows as a steady moderate breeze from the north-eastward, with fine settled clear weather and a moderately smooth sea.

THE SOUTH-WEST MONSOON commences in the Arabian sea about the middle or end of April and continues to the end of September, liable to a variation of from 10 to 15 days, being sometimes earlier, sometimes later, but is not felt in its full force until May or even June; it continues in full force during June, July, and August, blowing stronger and steadier, and accompanied by a heavier sea in the open than on the coasts. Near the Hindustan coast, the wind is variable in direction, and blows in squalls, accompanied by heavy rain, mostly from northward of west.

On the eastern coast of Africa this wind blows very strongly from south-south-west and continues with full force from that quarter through the channel between the island of Sokótra and Ras Asír, and from thence across the Gulf of Aden to Ras Rehmat (which signifies in Arabic the cape of Wind's Death), a cape south-westward of Makalla. On this line, a vessel generally enters the monsoon when proceeding eastward from the Red sea.

LOCAL WINDS AND WEATHER.—Having given a general outline of the wind system affecting these seas, a more particular description of the winds as they affect different localities follows, premising that though heavy gales in the

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ordinary acceptation of the term are almost unknown either in the Red sea or Gulf of Aden, yet strong winds, approaching the force of a full gale, are not infrequent, especially in the Gulf of Suez, in the southern part of the Red sea, and in the Gulf of Aden.

Red sea.—Throughout the Gulf of Suez, a hazy horizon is generally a sign of a breeze, but is not always its precursor; the same remark applies to a light fleecy cloud hanging above the tops of the Tor or Sinai mountains, as seen from the southern entrance of the Straits of Jubal. When the high lands are capped, or the weather is misty, continuous strong winds from the northward may be expected.

Between Suez and Jidda, northerly winds prevail all the year round, and, during the summer months, southward of Ras Abu-deraj, there is rarely a lull in them. From December to March inclusive these winds blow fiercely, moderating at full and change, with an occasional southerly moderate gale, foretold by damp weather and by a falling barometer; during these months, westerly gales occur in the Gulf of Suez and as far southward as the Dædalus reef, accompanied at times by dense fogs of dust; on the Arabian coast near Jidda violent north-easterly winds are also felt. During the winter months, as previously remarked, calms are of but short duration.

In fine weather, and near the shore, land and sea breezes are common throughout the Red sea, but especially in the southern half, the sea breezes at times blowing with considerable strength.

In the southern part of the Red sea, between the Straits of Bab-el-Mandeb and the parallel of 17° N., as before explained, southerly winds are experienced in the central track from October to May, prevailing from November to April, often blowing strongly from the south-eastward. About December, these winds bring hazy weather with squalls and rain. After February, or even earlier, their strength becomes more uncertain and they may be broken by northerly winds, but, not infrequently, the strong southerly winds last into May.* A heavy but short sea is raised by these winds.

During March, April, and May, the period of the breaking up of the North-east monsoon in the Arabian sea and before the South-west monsoon is thoroughly established, the weather

* At the end of January, 1903, when westward of Great Hanish island, H.M.S. *Harrier* experienced a sudden shift of wind from south to north-north-west; it continued to blow strongly from the northward for the next four days, the ship being then in the vicinity of Kamarán bay.

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is unsettled, with easterly squalls, occasionally rain, and sometimes sand-storms. The fine impalpable dust filling the air in these storms is very distressing to sight and breathing whilst they last, and, at times, they are dangerous to navigation from the sudden obscurity they occasion. Commander Aldrich, H.M. surveying vessel *Fawn*, gives the following description of a sand-storm experienced on the 14th May, 1881, which may be taken as a fair sample of many described by other officers:—
" The weather during the early part of the day had been fine,
" with a light southerly wind and cloudy sky. At 2 p.m. a
" heavy bank of cloud came up from the south and soon over-
" spread the sky; the wind fell calm. An hour and a half
" afterwards, a yellowish cloud approached from the eastward
" and the wind, springing up from east-by-south, freshened
" almost immediately to a strong breeze. The cloud proved to
" be a sand-storm, and by 4h. p.m. every object more than one
" hundred yards distant was obscured, but the sky overhead
" remained clear. The storm lasted until 5h. p.m., during
" which time the wind shifted through east to north-east and
" fell light."

In the southern part of the Red sea, north-westerly winds commence in June, seldom blow with any strength, and become light and variable in August and September, with occasional southerly winds, long calms, and hazy weather in the latter month.

Near the shores of this region, land and sea breezes are experienced, the latter sometimes of considerable strength, and northerly winds are common all the year round until southward of Massawa.

Between April and June, Squalls come off the land with hazy weather while in July, August, and September, the winds are usually light and variable, with frequent long calms.

In the southern portion of the sea, southerly winds blow with less strength on the western than on the eastern coast.

During the winter months, throughout the Red sea, northerly winds are generally accompanied by dry, and southerly winds by a damp, atmosphere. A change of wind is thus often indicated some hours before it takes place, and before any other sign is visible.

During the summer months, the atmosphere is generally damp throughout the Red sea but the sky overhead is clear.

The North-east monsoon of the Indian ocean blowing home becomes, as before stated, a south-easterly wind in the southern part of the Red sea. Vessels, proceeding southward during the

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winter months usually find, however, that on leaving the Straits of Bab-el-Mandeb, though they still have a head wind to contend with, it is much diminished in strength.

Gulf of Aden.—Within the Gulf of Aden, that is, between the meridians of Ras Asir and Bab-el-Mandeb, during the South-west monsoon season, the winds are very variable; as a general rule, they are freshest by day and lightest by night. About the end of April, before the monsoon has regularly set in, they vary in direction from east-north-east to south-east and south, usually with clear weather, though hazy weather is sometimes experienced; close in-shore, land winds are occasionally felt from 4h. to 8h. a.m. June is a very unsettled month, the wind uncertain, weather at times clear, but generally hazy; in the morning, it is either calm or there are very light airs which sometimes increase towards noon to a fresh breeze from the southward, occasioning a long swell on the Arabian shore. Towards the middle of the month, and in July and August, between the Straits of Bab-el-Mandeb and Burnt island, strong westerly or south-westerly winds may be expected; these blow out of the Red sea as a north-westerly wind, sometimes, as previously stated, enabling a vessel bound eastward to reach the monsoon in the Arabian sea; but, as a general rule, she will lose the wind before reaching Ras Rehmat, and will not fall in with it again until it bursts from the southward through the channel between Sokótra and the mainland of Africa.

Moderate southerly winds may also be expected during these months, blowing only during the day and declining to a light air at night. On the Arabian coast, after the southerly wind dies away in the evening, severe land squalls are not infrequent, which, rising in a thick cloud of dust, especially where the coast is low, give ample warning to the seaman. There is always a long southerly swell on the Arabian shore at this season.

Near the coast of Africa, from Ras Asír westward, at this season, heavy land squalls are experienced from about south-south-west; they generally come off between midnight and daybreak, lasting about an hour, are frequently followed by a calm, and as frequently, by a westerly on west-south-westerly breeze. These land winds are always parchingly hot and very disagreeable.

In September, the westerly winds cease and land and sea breezes prevail, as also in October. The nights are calm and sultry.

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Early in November the North-east monsoon commences in the Gulf of Aden, and in the steadiness of wind and weather offers a striking contrast to the South-west monsoon period. The prevailing winds are now between east-north-east and east drawing to south-east as the entrance to the Red sea is approached, and blowing fresh at times. Towards the end of December and early in January, it frequently blows with the force of a moderate gale, accompanied by heavy rain. Throughout the remainder of January, February, and March, easterly and east-north-easterly winds prevail, increasing in strength as the Straits of Bab-el-Mandeb are neared. The weather is generally clear, cool, and agreeable; rain may sometimes fall, but not in any great quantity. These are the three principal months for local trade.

Ras Asír, Sokótra, &c.—The South-west monsoon blows with great force through the passage between Ras Asír and the island of Sokótra, with thick hazy weather; the North-east monsoon with much less force, and the weather is generally fine and clear.

On the northern side of Sokótra, during June, July, and August, the height of the South-west monsoon, the wind, according to native report, blows in hard and violent gusts, whilst on the southern side it is steadier and not so strong, but there is a tremendous surf on the shore. Occasional showers of rain also fall at this season. In September, October, and November, light land and sea breezes occur, and the wind has a tendency to become more steady from the northward towards the latter part of that time. From November to January, the prevailing wind is north-north-east, and as it blows in violent gusts for several days at a time, the northern side of the island then becomes a dangerous coast to be near. From February to May is the fine season, when anchorages on the northern coast are considered to be safe.

South-east coast of Arabia.—On this coast, from Kosair to Ras Al-Hadd, the South-west monsoon sets in late in May and ceases towards the end of August; the sea is not usually so heavy as that experienced in the open or near the western coast of India, and the sky is generally clear, but the weather hazy. Southerly winds frequently set in early in March and blow very fresh; these must not be mistaken for the monsoon, as they are followed at the end of the month and in April by light and variable winds along the whole line of coast. May is a doubtful month.

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In the vicinity of Khorya Morya bay and islands, the South-west monsoon is reported by the natives to set in with a gale of wind, thunder, lightning, and rain.

The south-west monsoon is in its full force from June until the latter end of August; it blows strongest and the sea is heaviest on that part of the coast between Ras Merbat and Masira island, especially in Khorya Morya bay and in the month of July. During these months, the ordinary Arab traders do not venture to sea; the larger boats run up the coast early in June, after the first burst of the monsoon, and also towards the latter end of August, when they consider the monsoon to be over. Slave dhows, however, frequently run through the strength of the monsoon.

In September the winds are moderate from the westward and southward. In October, light variable breezes and calms prevail; in-shore, land and sea breezes are sometimes experienced, and occasionally, at night, a passing shower of rain. As a general rule, rain seldom falls on this coast, except in the province of Dhofar and in the Gulf of Aden; but heavy dews may always be expected. The atmosphere in the South-west monsoon is generally very hazy, and the land consequently not visible until quite close, rendering it necessary to pay great attention to the lead.

On this part of the Arabian coast, light and variable winds are experienced during October. In November, between the island of Masira and Ras Al-Hadd, light land winds of short duration, and sea breezes from south-east to south, generally prevail; but southward and westward of Masira, land winds are rare. A strong breeze from north-east, with a short chopping sea, is by no means unusual during this month and early in December, and is always looked for by the native navigators.

During December, January, February, and part of March, the north-east monsoon blows along the whole line of coast varying with the direction of the coast-line. At a distance from the coast, it blows from between north-east and east by south, with clear pleasant weather, free from squalls and rain, but, near the shore, the atmosphere is generally hazy, particularly when land winds are blowing. Fogs are also prevalent in the vicinity of Ghubbet Hashish and the Gulf of Masira.

The Belat.—Between Ras Sakar and the island of Masira, a strong land wind, known as the Belat, may be expected from the middle of December until the middle of March; this wind blows from north to north-north-west and lasts from one to three days, and at times even to seven days. Indication of its

Wind charts for Atlantic, Indian, and Pacific Oceans, Nos. 2931 to 2934.

approach is generally given by a faint hazy arch over the land the previous evening, or by the wind shifting towards the land, sometimes in sudden gusts, early in the night. The commencement of the Belat is frequently accompanied by a dense sand-storm, especially when near the shore. This presents all the appearance of a thunder-storm, but the colour of the cloud is a dark red. The atmosphere is always hazy during the continuance of the belat.

Belats nearly always set in between midnight and 4h. a.m., commencing with a light breeze and increasing to a moderate gale in about an hour, blowing hardest on the succeeding days between 9 p.m. and 10 a.m.; they usually cease about noon as suddenly as they commenced.

The squalls during these winds are very dangerous to sailing vessels close in-shore, as during the night the belat occasionally dies away to a calm of about an hour's duration, succeeded by heavy gusts from the mountains, at intervals of a few minutes for five or six hours. These gusts, like white squalls in the Mediterranean or the willie waws of Magellan strait, give no warning, except the noise they make in passing over the water, and, are sufficiently strong to dismast a vessel unprepared for them. Off-shore, a high sea is raised by these winds. In some years they are rare, while in others they are frequent and very violent. Belats are often succeeded by strong south-easterly winds, causing a considerable swell.

The winds and weather in the bay of Khorya Morya appear to be more boisterous and variable than on any other part of this coast; the belats are more furious, and south-south-westerly gales are common, during the months of February and March; the changes of the wind are sudden and give little or no warning.

About Masira, south-easterly winds are more prevalent than any others in February and March, varied occasionally by a moderate north-easter. Fresh southerly breezes of two or three days' duration may be experienced occasionally in the Gulf of Masira.

From the middle of March to the end of April, the winds are light and variable along the whole coast, whilst land and sea breezes are felt in-shore. From about the Gulf of Masira to Ras Al-Hadd, north-easterly winds become lighter, and south-easterly and south-westerly winds more frequent.

Too much confidence must not, however, be placed on the probable direction of winds in the neighbourhood of Masira,

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for experience proves that the seasons are anything but regular; and frequently, in the same month in different years, totally opposite winds are experienced.

CYCLONES.—Though moderate gales, as previously described, are not uncommon, hurricanes or cyclones are happily unknown in the Red sea, and are of but rare occurrence in the Gulf of Aden or in the Arabian sea; most of those of which there is any record having been chiefly confined to the western coast of India. There are, however, a few exceptions.

In April, 1856, the P. and O. Company's steam-vessel *Malta* and the ship *Haddington* suffered much during a cyclone southward of Khorya Morya bay, and the E.I. Company's steam-vessel *Queen* was nearly lost at the same time.

Between June 1st–3rd, 1895, a cyclone traversed the whole length of the Gulf of Aden, its path being almost due west. Its centre passed over the northern part of Sokótra at about noon of the 1st, being met with at about 50 miles northward of Ras Asír, at midnight, by the French vessel of war *Le Fabert*. Its track from thence westward, appears to have been about the middle of the gulf, passing some 50 miles southward of Aden at about 3h. p.m. on the 3rd June; from thence towards the Gulf of Tajura, passing southward of Obokh about 9h. p.m.; the rate of progress of the cyclone from Ras Asír was thus about 10 miles an hour. The wind was from north-east to east over the whole northern portion of the gulf, and at Aden, between the hours of noon and 3h. p.m., the velocity was registered from 90 to 50 miles an hour; 2¼ inches of rain fell on that day. At Obokh, the wind was fitful on the 3rd, settling at east about 4h p.m. with continuous rain, shifting to south, at 9h. p.m., and then to south-west.

In the Gulf of Aden, the sea near the path of the storm was terrific. The steam-ship *Inchulva*, of Liverpool, experienced its full force about 60 miles south-eastward of Aden and narrowly escaped foundering. This vessel passed the islands of the Red sea on the 1st June, when the storm had not yet reached Ras Asír, and had light variable airs with hot sultry weather and a smooth sea. The barometer began to fall slightly on the 2nd, when the centre of the cyclone was yet 450 miles distant, but no rapid fall set in until 8.30 a.m. on the 3rd, only three hours before the centre passed close to the ship; the lowest reading was 28·10 inches, during the height of the storm. The French vessel of war *Renard* left Obokh

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about 4 or 5 hours before the storm reached that place, and foundered; the German vessel of war *Augusta* also foundered near Aden, and many other vessels disappeared.

This cylone was preceded by the usual threatening appearance of weather; by thunder, continuous lightning, and heavy rain; and in some cases, but not always, by a falling, and even very low, barometer. At Aden the barometer gave little or no warning, but an unusual swell set into the bay without any apparent cause. Near Perim these threatening appearances, with a halo round the moon and uneasiness among the sea birds, but with no barometrical disturbance, were observed on the 1st of June, nearly two days before the cyclone reached that neighbourhood.

On October 14th and 15th, 1896, a cyclone was experienced in the Gulf of Aden during which a British steam-vessel was seen to founder, and the s.s. *Juna* from Zeila to Bulhar was lost with all hands. This cyclone was met with by the P. and O. steam-vessel *Victoria* about 120 miles north of Sokotra, and by the P. and O. s.s. *Ballarat*, which left Aden on the 13th, and felt its full force the next morning in about lat. 12° N., long. 47° E., the wind from 3 a.m. to 5 a.m. being registered at 11 of Beaufort's scale.

On June 2nd, 1898, a cyclonic storm of considerable strength, which had advanced from the southward, was experienced by several vessels in the Arabian sea; its centre on that day was probably in about lat. 17° N., long. 58° E. In the storm area, winds of force 8 to 10 were experienced, with squalls of hurricane strength, torrential rain, thunder and lightning, and a dangerous sea. The disturbance continued to advance northward or north-north-westward, and on June 3rd the centre lay apparently near and westward of Maskat, at which place much destruction was caused. The storm was also severely felt at Jashk where considerable damage was caused, and also for a short distance along the Makran coast.

These storms, though rare, are the more dangerous in these regions from the difficulty of prognosticating their approach with any degree of certainty; the usual signs of approaching stormy weather should, however, never be neglected, especially at those seasons when cylones are most likely to be experienced, viz., at the change of the monsoons.

PRACTICAL RULES FOR SEAMEN IN TROPICAL CYCLONES, NORTH OF THE EQUATOR.

When in the region, and in the season of cyclonic storms, be on the watch for premonitory signs, bearing in mind, according to the locality, what will be the probable direction or path of a storm; also, *constantly and carefully observe and record the barometer.*

The path of the storm is the track that its centre takes, and from the centre facing in the same direction as the path, the semicircle on the right-hand of the path is called the right-hand, semicircle and is the most dangerous for a ship to be in; that on the left, the left-hand semicircle.

Indications of a cyclone being observed, heave-to on the starboard tack; then carefully observe and record the changes of barometer and wind, so as to find the bearing of the storm centre, from the ship's position, and also to ascertain by the shifting of the wind in what part of the circle the vessel lies. Much will often depend on heaving-to in good time.

To find the bearing of the centre, face the wind, then the centre of the storm will be from 8 to 12 points to the right; if the barometer has fallen five or six tenths it will be about 8 points; if the fall has been but slight and the storm centre distant, it will be from 10 to 12 points.

To find in which semicircle the vessel lies, if the wind shifts to the right, the vessel will be on the right-hand and most dangerous semicircle, in which case she should be kept on the starboard tack and increase her distance, if possible, from the centre. If the wind shifts to the left, the vessel will be in the left and comparatively safe semicircle; the helm should in this case be put up and the vessel run with the wind on the starboard quarter until the barometer rises, when she may be at once hove-to on the port tack. Should the wind remain steady and the barometer continue to fall, the vessel is in the path of the storm, and should run with the wind on the starboard quarter into the safe semicircle.

In all cases act so as to increase as soon as possible the distance from the centre; bearing in mind that the whole storm-field is advancing.

TIDES.—Red sea.—In the Gulf of Suez, a tidal influence is felt; and although the times of high and low water on the shore at many places differ from the times of the turning of the streams in the offing, the following general rule, derived from observations made by the officers of H.M. surveying vessel *Newport*, in 1872, is easily remembered:—When the water is

rising at Suez, the stream, throughout the whole length of the gulf, runs northward, and, when falling, southward. Both streams set fairly in mid-channel, with a maximum rate, at springs, of 1½ miles, and at neaps of half a mile an hour, except in the vicinity of Ras Abu-deraj, Ras Sheratíb, and Ashrafi islands, where the direction is uncertain.

In mid-channel in the Strait of Jubal, at the southern end of the Gulf of Suez, the tidal streams run at from 1½ to 2 knots, but within 2 miles from the reefs their direction is uncertain. In the immediate neighbourhood of any of the large reefs the rising tide sets towards the reef and the falling tide away from it. Between Ashrafi and Shab Ali, the tide runs northward longer than southward. When the tide is against the wind it causes a troubled sea. On the northern side of Abu Nahas reef, strong under currents were noticed by those employed in recovering treasure from the wreck of the steamer *Carnatic*, which vessel was lost in the year 1869.

In the portion of the gulf northward of Tor, high water occurs nearly at the same time as at Suez, the rise of tide increasing from 1½ feet at Ras Gharib to 7 feet at Suez. It is high water in the southern part of the gulf when it is about low water at Suez, and *vice versâ*.

There is a tidal rise and fall of 1 foot 9 inches at Ashrafi, and of 2 feet at the Brothers, more than 100 miles farther south-eastward; but there is a rise of only 1 foot 3 inches at Tor, and there appears to be none at cape Zeiti, though at both these places there is a daily range in the height of the water, depending on the strength of the wind, of from 6 inches to 2 feet. The water is highest early in the morning and lowest in the evening.

Along the shores of the Red sea, a rise and fall of tide has been observed in some places, and in some of the narrowest channels a tidal stream seems to flow; but at other parts, until the Straits of Bab-el-Mandeb are neared, it is imperceptible. Here, however, the tides of the Gulf of Aden begin to make themselves felt, so that at Jebel Zukur there is a rise of 2½ feet at springs, and of 7 feet at Perim.

Variation of sea level.—In the Red sea, however besides the tidal rise and fall, there is a distinct and marked alteration in the level of the waters, amounting to 2 or 3 feet, and dependent upon the season. On this subject, Captain S. B. Haines, Indian Navy, remarked as follows:—"It is an "established fact that the water is raised to a higher level in the "northern parts of the Red sea during December, January, "February, and March, from the force of the strong southerly "winds that then blow up that sea; and that in July, August,

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" and September, it is lower by 2 or even 3 feet, from the force
" of the strong northerly winds blowing down towards the strait.
" This fact is proved by the Dædalus shoal, which, though
" situated in the middle of the sea, is at one time sufficiently dry
" to have a tent pitched upon it, and at another season is covered
" with water."

At Suákin, Jidda, and other places, the same difference of level occurs, due to alternating northerly and southerly winds, the southerly wind producing the higher level. It has also been observed that during the summer months the reefs in the Strait of Jubal and in the vicinity of Zafarana point occasionally uncover at low water; at all other times they remain covered. This difference of level, dependent upon the season, though not large, is interesting both as a scientific and as a practical question.

At Port Thewfik, the mean sea level is about a foot higher during the winter months (November to April) than during the summer months (May to October). The identity of the mean sea levels at Suez and Port Said is established. The extreme difference caused by contrary winds observed at Suez is 8 feet 6 inches, and at Port Said 4 feet 6 inches.

Gulf of Adén.—On the northern shore of the Gulf of Aden between Perim and the Khorya Morya islands, the rise at springs is from $6\frac{1}{2}$ to $7\frac{3}{4}$ feet; farther eastward the rise increases, and is about 10 feet at the Gulf of Masira. On the western and southern shores, it varies from 8 to $9\frac{1}{4}$ feet at Zeila, to $8\frac{1}{2}$ feet at Berbera, and 6 feet at Ras Alula and Ras Asír.

The tidal wave strikes the whole length of the southern shore of Arabia almost simultaneously. At full and change, the time of high water on this shore is from 9h. to 10h., whilst at Perim it is about 8h.

The tidal streams in the Gulf of Aden are irregular, weak, and frequently overcome by the current. From as far eastward as Merbat, in long. 54° 45′ E., the flood stream sets south-westward. Beyond Merbat, the flood stream sets north-eastward towards Ras-Al-Hadd.

Current chart for Atlantic, Indian, and Pacific Oceans, No. 2640.

CURRENTS.— General.— The general drift of the current in the Red sea and Gulf of Aden is dependent on the monsoon season prevailing in the Arabian sea. Thus, in January, the height of the North-east monsoon, the general drift is westward in the gulf of Aden, and north-north-west in the Red sea. The strength of this general drift is very slight; nowhere in the open does it exceed one knot, and generally it is less than half a knot.

Current chart for Atlantic, Indian, and Pacific Oceans, No. 2640.

In July, during the South-west monsoon season, any general current in the Red sea is hardly perceptible; there appears to be, however, a tendency to a south-south-east set between the parallels of 20° N. and 17° N., and there is also some evidence of a very weak northerly set in the northern part of the district. On approaching Perim, the current sets from the Red sea into the Gulf of Aden; whilst, in that gulf, a strong easterly current is manifested on the Arabian side, and a somewhat weaker westerly current on the African side.

RED SEA.—Local currents.—Southward of the Strait of Jubal, these currents are irregular; they are probably caused chiefly by, and at first set with, the prevailing wind. After a long continuance of wind in the same direction, however, they are often found setting against it. This is particularly the case on the Arabian coast, where, after a north-westerly breeze of some duration has fallen light, a strong current runs northward. On the Egyptian coast, from November to March, the strong northerly and north-easterly winds which sometimes prevail at that season cause a strong westerly current, but, on the wind falling light, it sets in the reverse direction. The Arabian coast, between Jidda and Ras Muhammed, is therefore the best to work to windward upon, as, in addition to a sometimes favourable current, the land and sea breezes are more to be relied on.

With strong south-easterly winds, a northerly current of from half a knot to one knot is generally experienced between Ras Beilul and Great Hanish, but Commander Hoskyn's experience in H.M.S. *Myrmidon* (1885) led him to believe that the current runs stronger between Great Hanish and the Haycocks than between the Haycocks and Ras Beilul; also, that a much more turbulent sea will be found between Great Hanish and the Haycocks than farther southward. On many occasions H.M.S. *Harrier* passed eastward of Jabel Zukur during the north-east monsoon, and always found a turbulent sea prevail between a position about 15 miles northward of Abu Ail islands and lat. 13° 30′ N. On several occasions, with a strong north-westerly current running in the offing, a southerly set was experienced by the *Myrmidon* along the western shores of Jebel Zukur and Great Hanish islands.

CAUTION.—Cross currents.—Strong currents occasionally set across the Red sea, so that a good berth should be given to all outlying reefs and shoals; this is the more necessary as the strength of these currents increase rapidly as the shoals are neared. They form one of the chief obstacles to the safe navigation of the Red sea, and to them has been attributed

Current chart for Atlantic, Indian, and Pacific Oceans, No. 2640.

the loss of several steam-vessels in former years. The knowledge of their existence should impress the mariner with the need of constant vigilance.

The comparison of forenoon and afternoon sights is much affected by refraction, which produce an apparent cross current. The mariner should be careful to fix his position by observation of twilight stars, morning and evening; there is reason to believe that such observations are not so liable to error from refraction as those taken during the day. *See* Refraction, page 28.

In the middle of the central channel, the rate of these cross currents seldom exceeds 20 miles a day. They are met with at all parts of the sea, but are especially dangerous to vessels approaching the Gulf of Suez from the southward, when nearing the entrance. Also, in proceeding southward, from the vicinity of the Suákin group until Jebel Zukur is passed, the greatest caution is required.

No fixed law can be given for cross currents, as they are often experienced without any apparent cause; but it appears that during the prevalence of the strong wind blowing into the Red sea from the southward, an easterly set is most frequently experienced, and its rate may be from half a knot to 1½ knots.

One great cause for watchfulness as to the effect of cross-currents arises from the fact that when they set strongly across the sea, either eastward or westward, at one part, it by no means follows that the space under the influence of this current is of great extent; on the contrary, a strong easterly set at one part may within a few miles cause an equally strong counter-current to the westward. Thus, a vessel proceeding northward may have ascertained during a run of, say, 50 miles in 5 hours, that she has been set 8 miles westward, but she must not conclude from that fact that the next 50 miles will be subject to the same current, for it is not only possible, but quite probable, that she may be on the point of entering a space where the current is in the opposite direction and of equal force.

Season currents.—From about May to September, while the South-west monsoon is blowing in the Indian ocean, the water runs out of the Red sea; but, during the North-east monsoon, from October to March, it runs in; thus accounting for the difference of level before remarked upon, which has been observed to depend on the season of the year.

In the Strait of Bab-el-Mandeb these currents often have a rate of 30 or 40 miles a day, but their strength is much diminished a few miles up the sea; and in the straits it is somewhat confused through the irregular tidal influence there felt. At the change of monsoon there is little or no current.

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Surface current.—From observations made by H.M. surveying vessel *Stork*, in January 1898, whilst at anchor in 118 fathoms 7 miles south-westward from Perim island, it would appear that the surface current runs steadily into the Red sea at that season at an average rate of $1\frac{1}{2}$ knots, but, that although the current is always setting in on the surface, its rate is greatly accelerated, or retarded, by tidal influence. From about 8 hours before to 4 hours after the highest high water at Perim, the rate of the current inwards is from $1\frac{1}{2}$ to $2\frac{1}{2}$ knots; whilst from 4 hours after to 8 hours before the highest high water, the rate of the windward current is from 0 to $1\frac{1}{4}$ knots.

Under-current.—From observations made in the Straits of Bab-el-Mandeb in January, 1898, it was established that while a permanent surface current of about $1\frac{1}{2}$ knots was setting into the Red sea, at that season (that of the southerly winds), there was, at a depth of 105 fathoms, a permanent current setting outwards at probably the same rate, the dividing line between the two permanent currents being at a depth of about 75 fathoms. Both are influenced by tide as mentioned above.

GULF OF ADEN and ARABIAN SEA.—Currents.—Great attention has been given to the subject of the currents of the Gulf of Aden, and the general conclusion arrived at is, that they are set in motion by the prevailing winds of these regions, increasing or decreasing in rate according as the winds increase or decrease in force; also, that, near the shore, they are in some degree influenced by the moon's age and consequent tidal action, which latter influences are very irregular and uncertain in their operation.

As these prevailing winds are chiefly those of the Arabian sea, it becomes convenient to consider the currents of the Gulf of Aden and Arabian sea together; and, as the currents of both depend on the monsoon which may at the time be blowing, it is again convenient to describe the currents of the two seasons separately.

CAUTION.—Before doing so, however, it may be well to caution vessels bound to or passing near Aden against a current common to both monsoons and found to set round Ras Marshag northward into the bay between that point and Ras Seilan, sometimes at a rate of 4 knots, and frequently at and over 2 knots. This current is extremely dangerous to vessels bound westward for Aden or for the Straits of Bab-el-Mandeb. Many such, unaware of its existence, having shaped a course to carry them well outside Ras Marshag light, have been surprised at making that light broad on the port bow. In August, 1906,

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the Italian gun-boat *Aretusa*, in thick weather found herself thus embayed northward of Ras Marshaz in only 3 fathoms.

South-west monsoon.—The currents in the Arabian sea at this season are regular in direction, but their rate depends much on the force of the wind and local circumstances. Their general direction in the middle of the sea is about east, inclining to south-east as the western coast of India is neared; the average rate is one knot.

On the northern part of the eastern coast of Africa, southward of and off Ras Asír, the current, though variable, generally sets northward along the coast, but inclining off the land, at from 2 to 4 knots;* the maximum rate being at times attained in July and August. It passes through the channel between Sokótra and Ras Asír at about the same rate, the main body from thence pursuing a north-easterly direction until it mingles with the current setting along the Arabian shore out of the Gulf of Aden, which, as elsewhere stated, runs from one to 2 knots. In the offing, its direction may vary from north to east-north-east, with a rate at times of 3 knots.

At Ras Asír, the in-shore branch of the current sets close round that cape westward, and close along the African shore at about one knot, as far as Ras Khanzir, near the meridian of Aden, where it turns off northward and eventually unites, as the main body has already done, with the easterly current along the coast of Arabia.

About 150 miles southward of Sokótra is a great whirl of current, caused possibly by the interposition of the island; or, it may be that shoaler water exists at that spot; it commences about the parallel of Ras Hafún, when the current strikes off eastward to the 55th meridian, then southward to the 6th parallel, from whence it again curves north-eastward, through west, forming a complete whirl. At the northern limit, the velocity is about 4 knots, while, at its southern extreme, it is only about one knot. A very heavy confused sea is created by this whirl. In making the coast of Africa from the eastward, care should be taken to avoid the strongest portion of it by keeping well to the southward.

Northward of Sokótra, during the strength of the monsoon, the current sets east-north-east about 2 knots.

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* Though this statement fairly represents the general averages of the current at this season, the seamen should know that as little as 20 miles a day is sometimes experienced, and as much as 100 miles a day has been actually registered.

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North-east monsoon.—During this season, the current in the Arabian sea generally sets south-westward, its rate depending on the force of the wind. When the wind is light there is little or no current.

On the eastern coast of Arabia, between Ras Madraka and Ras Al-Hadd, the current sets south-westward at about three quarters of a knot.

During the North-east monsoon, the general set of the current on the northern shore of the Gulf of Aden, and on the northern coast of Sokótra, is westward, and the rate, from three-quarters to 1½ knots. On the African shore of the gulf, there appears to be a counter current of about one knot, from about December; the commander of the French cruizer *Catinat*, however, reports that during the north-east monsoon, along this coast there is frequently a current setting directly towards the shore at a rate varying between half a knot and 1½ knots.

In the centre of the gulf the currents are variable, but chiefly westerly; when the monsoon is very strong, its rate may amount to 1½ knots.

Southward of Sokótra, when this monsoon is fully established, the set is south-westward, and the rate from one to 2 knots.

Luminosity of the sea.—Appearance of shallow water.—Both the Red sea and Gulf of Aden are remarkable for the occasional peculiar luminous brilliancy of the sea water at night. Without any warning it will become suddenly illuminated as if on fire, causing alarm to the stranger who may be unacquainted with the phenomenon, by giving him the idea of his vessel being amongst breakers, but, on casting the lead, the deception becomes apparent. It occurs in the open sea as well as near the land, and whether in a calm or with a breeze. This appearance is probably caused by the presence of confervæ or other organic matter in the water.

By day, large patches of discoloured water due to these causes, and well known to be not uncommonly met with in the Red sea, are frequently mistaken for and reported as shoals, the appearance of which they closely resemble, and the test of the *lead* having been neglected.

Lieut. G. C. Frederick, H.M.S. *Sylvia*, remarks, "Whilst "surveying Jebel Teir and Hanish islands, in May and June, "1888, large patches or streaks of discoloured water, caused by "spawn, were frequently met with, and generally inside the "100-fathoms line. These patches appear exactly like shoal "water at a short distance, but, though soundings were taken,

" no changes were found in the depth, and there can be no " doubt that these appearances often lead to reefs being " reported by passing vessels who have not the time to verify " their statements."

This phenomenon has been repeatedly remarked on and described by other observers, and it is occasionally seen in the central channel of the Red sea as well as near the shoals on either side.

Refraction, &c.—Excessive refraction and mirage are frequently experienced in the Red sea, causing objects to be visible at a much greater distance than that due to their height. In September, 1902, the P. and O. s.s. *Arcadia* sighted the Brothers island light 22 miles distant, instead of 12 miles. In the same month, the commander of the P. and O. s.s. *India* observed this light at no less a distance than 30 miles; and, in November of that year, he remarked, "Brothers island appeared as a distinct mirage; land visible over 100 miles."

BAROMETER and THERMOMETER. (*See also* Meteorological tables, pages 554–560.)—Though barometric pressure varies but slightly in the Red sea and Gulf of Aden, except on those rare occasions of cyclonic disturbance already referred to, yet, a careful consideration of the statistics arranged by the British Meteorological Office and of the deductions from them is of very great value, and unmistakably demonstrates the intimate connection between barometric pressure and temperature on the one hand, and the winds and currents of these regions on the other.

Thus, in the month of January the mean height of the barometer is found to range from about 30·10 in the Gulf of Suez to 29·97 in about lat. 15° N., giving a gradient of 0·13 in about 1,100 miles. A second maximum of about 30·06 then exists in the eastern part of the Gulf of Aden, giving a rather smaller gradient, but for only about half the distance. The mean temperature at this time is from 64° in the Gulf of Suez to 79° in lat. 16° N.; whilst in the Gulf of Aden the mean temperature is about 77°. This is the season of the North-east monsoon in the Arabian sea, and, as described in previous pages, north-north-westerly breezes are blowing down the Red sea simultaneously with easterly and south-easterly breezes through the Gulf of Aden, and up through the southern part of the Red sea towards that belt where barometric pressure is lowest and temperature highest.

Again, in July the mean height of the barometer ranges from 29·79 in the Gulf of Suez to 29·67 off Aden; being throughout about 0·30 lower than in January, but the

minimum, in lat. 15° N., has ceased to exist, and also the relatively high pressure over the Gulf of Aden. The *mean* temperature now ranges from 82° in the Gulf of Suez to 90° in the southern part of the Red sea. A sharp fall appears on nearing Perim, and a second minimum of 84° is reached off Aden. These temperatures are higher than those for January by 18° for Suez, 11° for the southern part of the Red sea, and 7° for the Gulf of Aden. At this season, the belt of low pressure in the southern part of the Red sea has disappeared, and the wind is found to blow continuously from the Gulf of Suez, the point of permanent highest pressure, down the Red sea for its whole extent, and then out through the Straits of Bab-el-Mandeb and Gulf of Aden.

The southerly winds of the winter in the southern part of the Red sea are thus seen to have an intimate connection with the low pressure of 29·97 in lat. 15° N., but whether the winds blowing towards one another at this season cause the low barometer, or the low barometer causes the winds, is still a disputed point.

The low pressure over the southern part of the Red sea is evidently connected with the permanently high temperature of that region.

Sea temperature.—The specific gravity and temperature of the waters of the Red sea have a character of their own. The specific gravity is about 1,030 as against 1,028 of the Mediterranean, and 1,026 of the Indian Ocean; and the temperature from a depth of 100 fathoms to the bottom is from 69° to 70° Fahr. Near the surface, the mean sea temperature for January ranges from 65° in the Gulf of Suez to 79° in lat. 19° N.; and from this position southward, as well as in the Gulf of Aden, the temperature is between 77° and 79°; these temperatures are some 1° or 2° higher than that of the air. In July, the sea temperature ranges from 77° in the Gulf of Suez to 89° in the southern part of the Red sea, and then, like the air temperature, it decreases rapidly to 84° near Perim, the minimum of 81° being reached off Aden; in the eastern part of the Gulf it again increases to 84° or 85°. These temperatures are respectively higher than those for January by 12° at Suez, 10° in the southern part of the Red sea, and from 3° to 5° in the Gulf of Aden. The sea temperature at this time appears to be about 5° lower than that of the air in the Gulf of Suez, and, in the southern part of the Red sea, about 1° lower.

Southward and eastward of Ras Asír and off Ras Hafún there are remarkable changes and differences of sea temperatures, especially during the South-west monsoon, which

it was formerly thought might prove of great use to the navigator when more knowledge on the subject had been experimentally acquired. The researches of the British Meteorological Office, however, as shown by the wind, current, and sea temperature charts of this vicinity (published by them, 1891), prove beyond a doubt that the mariner should place no trust in sea temperature as a factor in the navigation of his ship in this neighbourhood.* 14318.

The general result of these investigations may be said to show that the temperature of the sea surface off Ras Asír is much higher than off Ras Hafún during most of the South-west monsoon season. In July, when the monsoon is at its strongest and sometimes blows with the force of a whole gale, this is especially marked, the sea temperature within 5 miles of Ras Asír ranging from 88° to 77°, whilst a temperature of 80° and upwards is found 15 miles southward of that headland; but off Ras Hafún it is generally below 70°, and often down to 65°. This area of cold water along the African shore is very obvious, though from the changing nature of its limits, it is impossible to define them, and its existence is therefore of no use as an indication of a vessel's position; at times the change from cold to hot water is very sudden as Ras Asír is approached.

June and August may be said to resemble more or less the conditions of July, but in September they are very uncertain, though the cold water is still generally to the southward, and the average temperature is much lower in-shore off Ras Hafún than off Ras Asír; on the other hand, it then ranges comparatively high at some distance off Ras Hafún, and low at a very short distance off Ras Asír.

In the North-east monsoon, these great differences of sea temperature in this region become much less marked. Thus, in January, during the height of the monsoon, the temperature of the sea between Ras Asír and Sokótra varies from 73° to 79° or 80°, and is very similar to that off and in the neighbourhood of Ras Hafún; the current also is variable, seldom exceeding one mile an hour, and the north-easterly wind is light, though it sometimes attains the force of a strong breeze.

In May, when for a part of the month the North-east monsoon still blows, and, if the South-west monsoon has commenced, it has not acquired any strength, it has been observed that the water is fairly warm over the whole of this area.

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* These charts are published for each month of the year, and embrace the area defined by the following limits, viz., between lats. 10° N. and 12° 20′ N., and between longs. 50° 30′ E. and 53° E.

CLIMATE. (*See also* Meteorological tables, pages 554–560.) —The climate of the Red sea, during the summer, is perhaps, with the exception of that of the Persian gulf, the hottest in the world on the sea. In the latter part of June, the thermometer on board ship has been known to remain at 98° for three consecutive days and nights; in August, it not uncommonly rises to 105° in the shade. In vessels proceeding southward during the season, the great heat is often intensified by a light following wind insufficient in strength to cause a ventilating current of air to pass through a ship; and, moreover, the almost complete saturation of the air deprives a breeze of any invigorating effect. Near the shores, the air is not so damp and the heat is somewhat more bearable, even though the temperature should be higher.

Those not compelled to make voyages at all seasons, should avoid the Red sea from May to September both months inclusive. Death from heat apoplexy is not uncommon at that season.

In the winter, the climate is by no means unpleasantly hot.

In passing out of the Red sea into the Gulf of Aden in the hot season, a pleasant change of temperature is at once experienced. Also, in proceeding northward in the Red sea, when the dry northerly wind sets in, the thermometer gradually falls, and a cool and agreeable sensation is felt.

The climate of the Gulf of Aden, though warm, is cooler than the Red sea and may be considered generally healthy, there being no disease peculiar to it. Chills, and also exposure to the powerful sun, should be avoided. The natives of India, when on these coasts, are subject to beri-beri, a dropsical disease, which usually proves fatal in a few months; the only treatment for it appears to be a generous European diet.

The temperature in the Gulf of Aden varies with the prevailing winds; the following is the average range of the thermometer throughout the year:—

January, February, and March.—Weather generally clear. Thermometer ranges from 68° to 80° Fahrenheit.

April.—The weather becomes warmer. Thermometer 80° to 86°.

May.—Owing to light winds and calms, it is frequently intolerably hot. Thermometer 84° to 95°.

June.—During a westerly wind the temperature is considerably lower, and the change on leaving the Red sea is surprising.

July and August. Thermometer ranges from 77° to 87°.

September.—The weather, again becomes warm, owing to the cessation of westerly winds. Thermometer ranges from 84° to 96°.

October.—Towards the end of this month the nights become cooler, and at sunrise the thermometer sometimes stands as low as 78°.

November and December.—From the commencement of November to the end of the year, the weather gradually becomes cooler as the North-east monsoon increases, the thermometer ranging between 76° and 84°.

During the South-west monsoon, on the African coast, the heat is insufferable, especially when a land wind is blowing, at which time the thermometer sometimes rises to 110° Fahrenheit. The natives leave the coast at this season for the mountains to escape the heat and there is consequently a cessation of trade.

On the coast of Arabia, northward of Merbat, the weather is more pleasant than in the Gulf of Aden, and during the months of December, January, and February, it is even cold at night.

RAINFALL. (*See also* Meteorological tables, pages 554–560.)—The rainfall throughout the regions comprised in these descriptions is comparatively small. It is greatest in the neighbourhood of Sokótra, and becomes gradually less through the Gulf of Aden and southern part of the Red sea; the northern part of that sea is, as has been already stated, in a practically rainless district.

In the southern part of the Red sea, rains may occur from October to March, and even as late as May. About December, strong south-easterly winds bring squalls with rain; and during March, April, and May, the weather is here unsettled with occasional showers of rain.

In the Gulf of Aden, light rains fall from November to about February, and, eastward of Ras Rehmat, in July and August also. In Sokótra, there are heavy rains from November to February, and light rains from June to August.

NAVIGATION and PASSAGES.—The dangers of the Red sea have been greatly reduced by increased knowledge and by the system of lights now established, so that for steam vessels, at any rate, no difficulties exist which may not, with ordinary caution and attention, be easily overcome; one of the principal dangers arises from the uncertain cross currents frequently experienced (*see* page 23); but, from the general clearness of the atmosphere, astronomical observations can almost always be made, and a ship's position thus constantly checked. On account of the excessive refraction, well known

to exist in these waters, as before mentioned, no opportunity should be lost of verifying the position by means of early twilight, dawn, and night star sights. The Gulf of Aden is so free from dangers that its safe and expeditious navigation may be said to depend mainly on a correct knowledge of the prevailing winds, and the currents resulting from them, as previously described.

The adverse winds of the Red sea are much felt by steam-vessels of small power, as they may be obliged to work to windward under steam and fore and aft sails. Indeed, to make headway against the north-north-west wind of the northern part of the Red sea, or against the south-south-east wind of the southern part, often requires a full-power steam-vessel.

Outward-bound auxiliary steam-vessels are sometimes compelled to anchor on the northern side of Jebel Zukur, or in Kamarán bay, to await relief through having exhausted their fuel. Such vessels are recommended, during the winter season, to make all possible use of sails whilst the fair northerly wind lasts, in order to have a good reserve of coal when contending against the southerly wind.

Sailing vessels at times experience great difficulties when working against the strong winds, which, in the winter season, blowing from either end of the Red sea towards its centre, produce a short hollow sea, and, combined with the strong current that often runs with the wind, renders the progress of such vessels very slow.

CAUTION.—Off the Egyptian coast of the Red sea it is customary for coastguard vessels, some of them steam-vessels of 1,000 tons or upwards, to cruise at night without lights; they may be met with 20 or 25 miles from the land, and, consequently, great care is necessary to avoid collision.

The mariner is also cautioned nowhere to approach closely the outlying reefs, for, if bordering upon them in the expectation of hearing or seeing the surf, it is important he should be reminded that under no condition of wind or weather is there a heavy surf on the reefs. *See* page 2. The strength of the current also is much greater in their immediate vicinity, besides being often of a rotary nature—an additional reason for giving these dangers a wide berth at night.

In the neighbourhood of and amidst a cluster of reefs, a chart can avail the mariner no farther than in marking their outer boundary; within this, having the sun astern of the vessel he must be guided by the eye, as the only and best pilot, and a little practice in this mode of procedure will enable him not only to distinguish the dangers, but also to estimate the changes in depth from the various shades of colour.

Native pilots.—Before the Red sea was so much frequented, it was customary for vessels to engage Arab pilots for the voyage; and in the Gulf of Suez especially, before it was lighted, the services of these men were of considerable value. The altered circumstances of navigation have, however, done away with the necessity for this class of pilot altogether. Strictly local native pilots are still of service occasionally; their familiarity with positions of shoals and reefs in their own localities being very useful, especially under circumstances not favourable to piloting amongst reefs by the eye.

THE INNER CHANNELS.—These passages are useful for small steam-vessels, when prevented by strong foul winds from pursuing the direct central channel.

With the exception of occasional gaps, a continuous line of reefs runs nearly parallel with the shore, along the whole of the Arabian coast; and, in the channel formed between the reefs and the shore, there is always smooth water, and nearly always the depths are not too great for anchorage; for this and other reasons the Inner channel on the eastern side is easier of navigation than that on the western side. Most of the numerous detached coral rocks and banks have deep channels between them; from the intricacy of the navigation and the absence of trading ports on the eastern coast, it can never be of much use to steam-vessels.* The rising importance of some of the ports on the western shore of the Red sea have, however, led to the Inner channels on that side being partially lighted, and to their being much more frequented, and better known than formerly.

Chart 757. Chart, Gulf of Suez.

FULL-POWER STEAM VESSELS.—Through the Red sea and Gulf of Aden.—Outward bound.—A steamer having cleared Suez bay, for which purpose the Kal ah Kebireh lights and Newport rock light, together with the beacons and buoys marking the various shoals, afford ample guidance, should steer down the Gulf of Suez, keeping the western shore on board, but carefully avoiding the shoal off Zafarana point. That point, as well as Ras Gharib, 52 miles farther south, have lights very useful by night, as also

* H.M.S. *Philomel*, in February 1881, proceeded by the Inner channel from Loheiya to Lith. Throughout the passage, which occupied seven days, the sea was uniformly smooth and no current was experienced. The winds were chiefly from north-west, blowing strongly in the afternoon and falling light at sunset.

Chart 757. Chart, Gulf of Suez.

are the structures as marks by day; a bearing of Rhas Gharib light, should enable a ship to avoid the dangerous Sheratib shoals projecting from the opposite shore, as well as the Moresby shoal of only 3 fathoms lying in mid-channel 20 miles south-eastward of Ras Gharib.

The high land of the Zeiti hills makes at first like an island, and is a good mark in approaching the Strait of Jubal. By the time a ship is abreast of Ras Zeiti, the Ashrafi light should be well in sight; it should be passed from one to two miles distant, the width of the strait between the islands and shoals on the western side, and the dangerous Shab Ali, on the eastern side, being here only 6½ miles. Shab Abu Nahas, lies off the northern end of Shadwán island, is the most out-lying reef on the western side of the strait.

Ashrafi lighthouse (*Lat. 27° 47′ N., Long. 33° 42′ E.*), on with the high land of Zeiti by day, or the light kept on a N.W. bearing by night, clears this shoal, shortly after passing which the light on Shadwán island will show on a S. ¾ W. bearing. In order, however, to clear the reefs on the eastern side of the strait, the eastern side of Shadwán should not be brought westward of S. ½ W., nor the light opened out, until the peak of Jubal island bears northward of west.

During the run down the Gulf of Suez, the position of the vessel should be constantly checked; for, the tidal streams, though they set fairly up and down in mid channel, set towards the shoals as they are neared, and in the neighbourhood of some of the principal reefs their direction is extremely uncertain. Should a vessel require temporary anchorage whilst passing down or up the gulf, there are several available on each side, all of which will be found fully described in Chapter III.

Chart 2838. Chart, Straits of Jubal.

When abreast of Shadwán island, a vessel may shape course down the Red sea, passing 3 or 4 miles eastward of the Brothers, two little coral islets close together and surrounded by deep water, with a lighthouse on the northern island. These islets are 80 miles S.S E. ½ E. from Shadwán lighthouse, and 100 miles farther in the same direction is the Dædalus reef (*Lat. 24° 55′ N., Long. 35° 52′ E.*), a small coral patch occasionally awash but generally covered; it is only 6 cables

General charts 8a, b, c, d, e, also 2523.

Chart 2838. Chart, Straits of Jubal.

long by 2¼ cables wide, and steep-to; and, as it also has a lighthouse, it may be safely passed on either side, night or day, at a short distance.

Charts 8a, b, c, d, e, Red Sea.

From the Dædalus reef to Jebel Teir, the distance is about 656 miles, and there is a clear run down the central track for more than half that distance before the off-lying shoals of the Suákin group and Dahalak bank on the western side, and the countless islands and reefs of the Farisan bank on the eastern side, commence to narrow the width of the navigable channel, which from thence southward becomes constantly narrower and more dangerous until the Straits of Bab-el-Mandeb are passed. From the central track, St. John's island, 80 miles southward of Dædalus reef and 700 feet high, as also the Elba mountains and other high land on the western side of the sea, can generally be seen.

During the run down the Red sea, it is especially necessary that the mariner should be on his guard against the effect of cross currents to which reference is so frequently made, and to which attention is specially directed on every Admiralty chart of the Red sea. *See* page 23. No opportunity should be missed of checking the ship's position by astronomical observations, night and day, and it should be remembered that on account of the excessive refraction well known to exist in these waters, the most accurate results are those obtained at early twilight and dawn.

The navigation of the southern part of the Red sea has been greatly simplified by the establishment of lights, since 1904, on some of the principal islands, viz., on the south-eastern part of Jebel Teir, on the summits of Centre peak island of the Zebayir group, and on Quoin island of the Abu Ail group, as well as on the Arabian shore at Mokha.

Chart 143, Jebel Teir to Perim.

Jebel Teir may be safely steered for even on a dark night, though in coming from the northward, its light may be hidden through a considerable arc by the intervening high portion of the island. It is about 1½ miles in diameter, 800 feet high, and is steep-to; it is high and conical, gradually sloping to the extremes. Southward of Jebel Teir, and lying in the central track to the Straits of Bab-el-Mandeb are the Zebayir, Jebel Zukur, and Hanish islands, for detailed descriptions of which, *see* pages .

General chart 2523.

Chart, Jebel Teir to Perim, 143.

The Zebayir group of ten islets, besides rocks and shoals, occupy a space 13 miles in length, south-south-east and north-north-west; they are rugged and barren, the highest rising 627 feet above the sea. Both Jebel Teir and the Zebayir group should be passed on their western side, a good look-out being kept for Quoin island, the northernmost of the group, if the night be dark, as it is only a cable long, and 100 feet high, but the water is deep within 2½ cables of it.

Eastward of Jebel Zukur.—From Zebayir islands the track hitherto best known, and now assisted by the light on Quoin island off the Abu Ail group, is that here described, it lies eastward of Jebel Zukur and of the Hanish islands, and should always be followed at night.

Jebel Zukur is nearly 10 miles long north and south, by 7 miles wide, and 2,047 feet high; close off its northern end is a little islet called High island. At 3 miles eastward of North point, Jebel Zukur, lie the Abu Ail islands, of which Quoin island, the westernmost is 345 feet high, and on its summit stands the lighthouse. The channel lies between Jebel Zukur and the Abu Ail islands and is called the Abu Ail channel.

In passing westward of the Zebayir islands, and steaming against a southerly gale, so commonly met with during the winter season, it is advisable to give them a berth of a mile, as the set of the swell is towards the rocks.

Chart 453, Kamarán Passage.

From that distance westward of Centre peak island, the south-westernmost of the group, and also distinguished by the lighthouse on its summit, to mid-channel between Jebel Zukur and Abu Ail, the course and distance is S.E. by S. 66 miles; this course, however, only leads 5½ miles westward of the Avocet rock (*Lat. 14° 22′ N., Long. 42° 42′ E.*), which rock lies N. 18° W. 18½ miles from Abu Ail light; that light being visible 25 miles distant in clear weather. Great care should be taken to keep westward of this rock, bearing in mind the repeated cautions given as to the lateral or cross currents so frequently experienced in this sea, and to which was due, beyond a doubt, the loss of the s.s. *Avocet*, from which the rock was named.

The navigable width of the Abu Ail channel is more than 2 miles at the narrowest part, and the mid-channel depths from 40 to 50 fathoms.

General chart 2523.

Chart 453, Kamarán Passage.

The Hanish group occupies a space extending 18 miles southward of Jebel Zukur, but, after passing East point of that island, one mile distant, a ship's course carries her still farther eastward of all the islets of the Hanish group. The course from the centre of the Abu Ail channel to a position 7 miles west-south-west from Mokha is S.S.E., 52 miles; this leads $2\frac{3}{4}$ miles eastward of Low island, Little Hanish, and $4\frac{1}{4}$ miles from Mushéjera. As both islands are low and flat, it is best to give them a rather wider berth at night unless the weather is bright and clear.

Chart 143, Jebel Teir to Perim Island.

The high minaret of Mokha, and, next, the town itself, will be seen, as that place is approached; whilst, on a clear night, the light will be visible 19 miles distant. Shoal patches extend nearly 4 miles westward of it, but a depth of not less than 15 fathoms ensures passing outside them. The soundings along this coast are pretty regular, and the lead is a good guide. From off Mokha, a course may be shaped for Perim island. Vessels hugging the shore to avoid the strength of the wind and sea must beware of the shoals lying southward of Zi hill; the Chiltern patch of 3 fathoms, or possibly less, the outer shoal, is fully $2\frac{1}{2}$ miles from the shore and has from 10 to 12 fathoms close to it. If necessary, anchorage may be found in the bay as Ras-el-Mandeb is neared, and there are many anchorages available in the southern part of the Red sea after Jebel Teir is passed, for which *see* the charts.

Westward of Jebel Zukur.—Some vessels pass westward of Jebel Zukur and the Hanish islands and between the Haycocks and Mohabbakah islands.

An examination by H.M. surveying ships *Rambler* and *Stork*, assisted by H.M.S. *Kingfisher*, in 1891, failed to discover any reason why it should not now be safely adopted as a daylight passage. The possibility of the existence of other small rocks, like the Avocet and Penguin rocks, so long undetected, makes it, however, desirable to avoid the edge of the bank bordering the deep gully in the centre of the sea, and a vessel should keep in this deeper water from Jebel Teir to the Mohabbakah islands. Having passed between the South-west Haycock and High island, a good berth should be given to the Scilla shoals.

Chart 3180, Approaches to the Straits of Bab-el-Mandeb.

Straits of Bab-el-Mandeb.—In steering for these straits, Ras Bab-el-Mandeb makes as an island, with several peaks,

Chart 3180, Approaches to the Straits of Bab-el-Mandeb.

sloping down to a low point on the sea; immediately off the point is Oyster islet, with reefs extending 2 cables from its southern and western sides. Perim island will be seen to the right of the peaks when 15 or 20 miles distant; it is of moderate height, its outline even and unbroken, and it has lighthouses at each extreme and on its summit. A dangerous reef extends 2 cables off Azalea point, its south-eastern extreme. The Large strait is on the western side of Perim and is 9 miles wide; the Small strait, through which is the usual and most direct track, is between Perim and Ras Bab-el-Mandeb; the navigable channel for large vessels is nearly 1¼ miles wide at its narrowest part, and, being well lighted, is, with care, easy of navigation by day or night. Vessels should keep rather nearer to the Perim shore than the centre of the channel, Oyster island being difficult to make out at night owing to the high land behind it. *See* page 276 for detailed description of the Straits of Bab-el-Mandeb.

In the passage of this strait it must be remembered that the current becomes very strong at certain seasons, the water running out of the Red sea from June to September, the South-west monsoon season, and into it from November to April, the North-east monsoon season. During the strength of the monsoons it may be expected to run at the rate of 40 miles a day.

Charts 6a, 6b, Gulf of Aden—Eastern and Western Portions.

Gulf of Aden.—Having passed through the small strait of Bab-el-Mandeb, and, after carefully avoiding the shoal ground extending off-shore between Ras al Arâ and Ras Kaáu, having touched at or passed Aden, the navigation, from the absence of central islands, shoals, or obstruction of any kind, becomes of a different character to that of the Red sea, and the season of the year with its prevailing monsoon becomes the important consideration. Of mail and all other full-power steam-vessels, it need only be said that, during both seasons, they take the direct route to the Persian gulf, Bombay, Colombo, and other Indian ports, and, nearly so, to the Seychelles and Zanzibar.

1078, Passage chart.

SMALL-POWERED STEAM-VESSELS.—Outward bound.—If bound for the Persian gulf or for any of the Indian ports, during the summer or South-west monsoon season, the track of this class of steam-vessel is precisely the same through the Red sea, Gulf of Aden, and beyond, as that of full-power vessels, but, for other parts, they have to accommodate them-

1078, Passage chart.

selves to the prevailing wind as soon as the limit of the South-west monsoon is reached, thus:—

If bound for Seychelles or Zanzibar, and having passed northward of Sokótra, they should stand away to the south-eastward on the starboard tack and cross the equator in about 70° E., or as far westward as the monsoon permits; from thence, steaming southward through the doldrums, to fall in with the South-east trade, which will be met with in from lat. 2° to 4° S., and from thence direct to Seychelles or Zanzibar, making due allowance for the strong northerly set likely to be experienced when approaching the latter island.

Charts 8c, 8d, Red Sea sheets 3 and 4.

In the winter season, when the North-east monsoon of the Arabian sea causes strong south-easterly winds to prevail in the southern part of the Red sea, steam-vessels of small power proceeding to the southward may with advantage pass through the Massawa channel, westward of the Dahalak bank and islands. With this object, they should steer for North Bluff hill on the western shore, when southward of the Suákin group, and keeping from 2 to 4 miles off-shore, steer to the southward, passing inside the foul rocky ground, from 7 to 10 miles north-westward of Gannet bank, and westward of the latter shoal, as also of Difnein (*Lat. 16° 37′ N., Long. 39° 19′ E.*), on which island there is a light. At 36 miles southward of Difnein is another light on Sheikh ul Abu island, and again at 45 miles farther south-eastward is a light on Shumma island, which latter island lies in the centre of the channel; the passage, called the Narrows, lies between Shumma and the Assarka islands. Until Shumma island is neared, the navigable width of the Massawa channel is from 5 to 8 miles, but in the Narrows it is barely 2½ miles. The depths are moderate, from 40 to 25 fathoms, but deepening to 50 and 60 fathoms as the Narrows are neared, and shoaling again in them and after they are passed. In the channel, land and sea breezes are experienced, and, outside their limits, south-easterly winds blow with less strength than in the central track.

Chart 145, Jebel Teir to Perim Island.

After passing Shumma—and here the south-easterly swell begins to make itself felt—the channel again opens out, but a vessel should keep as close to the western shore as safety permits, the chart being the best guide, and every advantage should be taken of the lee afforded by headlands, islands, &c., until near the entrance of Asab bay, when it is best to quit the

Chart 143, Jebel Teir to Perim Island.

western shore, and passing northward of the Fieramosca shoal, with fore and aft sails set, to cross to the eastern side near Zi hill or as far south as the vessel will fetch. From thence the passage through the Straits of Bab-el-Mandab, and as far as Aden, is the same as already described for full-power steam-vessels.

Chart 6a, Gulf of Aden—Eastern Portion.

In the North-east monsoon, steam-vessels of very small power, after passing Aden, should keep close along the Arabian coast. The wind generally blows from about E.N.E., or in the direction of the coast, but its force seldom amounts to 5. If bound to the Persian gulf, they should, if possible, keep to the coast as far as Ras Al-Hadd, using steam and sail and taking every advantage of a shift of wind; and from Ras Al-Hadd stand over to the northern shore of the Gulf of Omán. If the monsoon is too fresh to be faced, proceed as for Bombay until in about lat. 14° N., long. 69° E., then steam due north to about lat. 19° N., and from thence on the starboard tack to the Persian gulf.

If bound to Bombay, the coast should be kept aboard as far as the Khorya Morya islands, or beyond them if the monsoon is light there; but, if the monsoon is fresh, the vessel may make sail before reaching the islands and stand to the south-eastward, as the wind will gradually draw to the northward, or westward of north, as the vessel advances eastward, enabling her with steam and sail to head for Bombay.

If bound to Ceylon, and the monsoon is fresh, sail may be made from abreast of Ras Fartak, in long. 52° E., though it is desirable to get a little farther north-eastward if possible.

FULL-POWERED STEAM VESSELS.—Homeward bound.—South-west monsoon.—Mail and other full-power steam-vessels from Colombo and the southern ports of India take the direct route, during the South-west monsoon as before stated, passing southward of Minikoi island light, from thence direct to a position about 40 miles northward of Sokótra, thence direct for Aden and the Red sea.

There is an alternative route for vessels of moderate power, having passed close southward of Minikoi, by keeping in its parallel of about 8° N. until in the meridian of 60° E., thence gradually edging for Ras Asír.

From Bombay, the direct route is taken by the Peninsular and Oriental Company's steam-vessels and others of a similar class. Vessels of moderate power, if the monsoon is very strong, take what is now known as the Northern passage. Those of small power take the Southern route, hereafter described.

General charts 2523, 1012.

Chart 6a, Gulf of Aden—Eastern Portion.

Caution. — It is always dangerous to pass near, or attempt to weather Sokótra in the South-west monsoon, as the land is often shrouded in mist, and the depths are so considerable that the lead gives no warning of proximity to the dangers which extend some distance from the shore. Moreover there is little to be gained, in point of time, by passing close to this island as vessels passing 40 miles northward of it only add 8 miles to the distance from Colombo to Aden; no vessel should therefore attempt to make the island or pass it within 40 miles, when bound westward, more especially in the South-west monsoon.

The Northern passage is about 50 miles longer than the direct route, and is made by keeping on the parallel of Bombay until within about 100 miles of the Arabian coast, from whence the course is shaped along-shore to pass about 20 or 30 miles off the headlands. Between the meridians of 66° and 60° E. the sea and wind appear to be at their height, the sea being very high; westward of 60°, the sea, and then the wind, begin to abate.

The adverse current experienced on this passage averages one knot an hour; eastward of the meridian of 60°, it is from half to three quarters of a knot, and, westward of 60°, from one to $1\frac{1}{3}$ knots.

In the North-east monsoon, full-power steam-vessels take the most direct route, whether from the Persian gulf, India, Seychelles, or Zanzibar; if from the latter places and passing between Sokótra and the mainland, *see* Caution, page 44, as to rounding Ras Asír.

Chart 143, Jebel Teir to Perim Island.

Bab-el-Mandeb to Suez.—Having arrived at the Straits of Bab-el-Mandeb, the return track up the Red sea is the same as the outward track already described, and it is only necessary to repeat the caution so often given, that the mariner should be very watchful as to the effect of cross currents. When clear of the islands and shoals of the southern part of the Red sea, this caution again becomes especially necessary as the entrance to the Gulf of Suez is neared.

Chart 757, Gulf of Suez.

Having passed the Brothers (*Lat. 26° 19′ N., Long. 34° 51′ E.*), it is best to steer direct for Shadwán island, which can generally be seen about 30 miles off by day; and, by night, its light is visible 20 miles. During this run, a westerly cross current has often been found to be very strong, but

Chart 757, Gulf of Suez.

occasionally it is easterly. The Jifatin islands, 15 miles southward of Shadwán, with their steep brown faces, serve to identify the land-fall.

Having passed Shadwán at about 1½ miles and Shab Abu Nahas at 3 miles, Ashrafi light will come in sight. By keeping this light bearing between north-west and west-north-west all dangers on both sides in the southern part of the Straits of Jubal will be avoided.

The rounded peak of Jubal island forms a good mark to check a vessel's progress, and the western side of the straits should be kept on board, as the landmarks on that side are generally conspicuous. In thick weather, do not shoal to less than 40 fathoms.

After passing Ashrafi light, it should be brought to bear S.E. by S., when a N.W. by N. course leads up the gulf passing 2 miles clear of Ras Zeiti and 3½ miles westward of Moresby shoal. On this course, if correctly steered and no cross current experienced, a vessel should pass Ras Gharib light nearly 4 miles distant. From thence, a N. by W. ⅞ W. course leads 4½ miles outside Zafarana light, but care must be taken to avoid the Sheratib shoals on the starboard hand. Zafarana lighthouse when seen from the southward shows against the face of the high land behind it. From abreast of Zafarana point, a N. by W. ½ W. course leads 2 miles outside the shoal off Ras Abu-deraj, and when the northern end of the Abu-deraj mountains bears W. ½ N., or when 30 miles distant from Zafarana lighthouse, steer N. ½ E. to sight the Newport rock lighthouse and proceed to the anchorage in Suez bay as directed in Chapter II., page 90.

Caution. — In misty weather, by day, if a vessel has been set westward, the Jifatin group, sighted on a north-westerly bearing, may easily be mistaken for Shadwán island. As there is deep water on the eastern side of both groups, a vessel in any doubt should pass near enough to see the lighthouse at the south-eastern end of Shadwán, or the light, if it be at night, and thus identify the land sighted. The absence of a lighthouse would, of course, show that it was the Jifatin islands close aboard.

The eastern shore between Ras Mallap and Suez should be approached with caution at night, as the coast is of a gravel colour, low, and bordered by extensive plains rising gradually to the hills, which make the distance from the shore very deceitful. As before remarked, this side of the gulf should, as far as possible, be avoided in favour of the safer western side.

General charts 2523, 748b.

1078, Passage chart.

SMALL-POWER STEAM-VESSELS.—Homeward bound.—South-west monsoon.—From Bombay, the best track for small-power steam-vessels to the Red sea during June, July, and August, is to pass westward of the Laccadive islands under fore and aft sails, bearing in mind that almost all the rain squalls met with off the Malabar coast, or 200 miles westward of it, are from northward of west, and are of material assistance to such vessels in making their southing; when in about lat. 9° N., where the wind becomes lighter and the water smoother, make westing to about long. 61° E. in lat. 7° N. from thence, edge off west-north-west for Ras Asír, taking care not to go northward of lat. 10° N. until in long. 53° E., so as to avoid the heavy cross sea caused by the whirling current southward of Sokótra.

Steam-vessels with insufficient power to take the above route, should follow that recommended for sailing vessels (*see* page 46), using steam between the South-west monsoon and the South-east trade, and also along the north coast of Africa from Ras Asir to Burnt island.

An alternative route is to pass eastward of the Laccadive islands, through the Nine degree channel, and down to the parallel of about lat. 4° N. Then follow that parallel to about long. 60° E., and from thence north-westward for Ras Hafún and Ras Asír.

Chart 6a, Gulf of Aden—Eastern Portion.

CAUTION.—Rounding Ras Asír (*Lat. 11° 50′ N., Long. 51° 16′ E.*).—Many wrecks have occurred on the coast southward of Ras Asír, and the utmost caution is necessary when rounding this headland from the southward or south-eastward during the South-west monsoon, when the weather is stormy, with a heavy sea and strong current, and the land generally obscured by thick haze.

The similarity of outline in the headlands of Ras Jard Hafún and Ras Asír is a fertile source of danger. Ras Jard Hafún is, however, 2,900 feet in height and much the higher of the two; Ras Asír being only about 780 feet high and separated from Ras Jard Hafún by a broad sandy plain of little height compared with the two headlands that bound it.

In hazy weather, at night, the steep fall of Jard Hafún may be dimly seen from the deck of a vessel, and when this bears southward of west, if Ras Asír is not sighted, as is often the case from the haze being thickest in the lower strata, and also from the light colour of the hill rendering it difficult to discern, the navigator, mistaking Ras Jard Hafún for Ras Asír, fancies

Chart 6a, Gulf of Aden, Eastern Portion.

he is rounding the latter, steers westward into the low bay of Wadi Tuhom, and discovers his error too late for remedy.

During daytime, a gradual change from blue to dark green will probably be observed in the colour of the water; it also becomes smoother and the swell alters its direction to eastward of south when the meridian of Ras Hafún has been passed. To ensure safety, however, when the land cannot be clearly seen and recognized, the lead, and the lead alone, should be relied on.

As soundings extend from 10 to 12 miles from the shore, the deep sea lead should be frequently used in dark hazy weather, and the vessel's course altered to N. by E., or, if necessary, still more eastward, immediately soundings are struck or the land sighted. By running northward in this manner, and by not standing into less than 35 fathoms, a vessel's safety is ensured, and as the water rapidly deepens northward of the parallel of Ras Asír, the 100-fathoms line being only 2½ miles from it, there should be no difficulty in deciding when to alter course to the westward.*

It was formerly thought that the sea temperature might prove a useful guide in approaching Ras Asír, it being stated that the surface temperature decreased considerably as the coast between Ras Hafún and Ras Asír was approached, a sudden rise to 80° taking place only when northward of Ras Asír, and that this rise could be accepted as an indication that Ras Asír had been passed. This theory was disproved by the London Meteorological Office, on testing a large number of observations; for, although true that northward of Ras Asír the sea temperature is always high, it is by no means always low off Ras Hafún; any action, therefore, founded on sea temperature in this neighbourhood would be most dangerous.

When westward of Ras Asír, the African shore should be kept aboard as far as Burnt island (*Lat. 11° 12′ N., Long. 47° 13′ E.*), in order to take advantage of the smooth water and favourable current; from thence, steer direct for Aden, observing the Caution at page 25 as to a dangerous local northerly current just eastward of that port, and along the Arabian shore for the Straits of Bab-el-Mandeb.

Chart 1012, Arabian Sea.

From the Persian gulf to the Red sea or Gulf of Aden, during the South-west monsoon, small-power steam-vessels should stand away south-eastward, passing well westward of

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* There are rather extensive 40-fathoms banks about 25 miles N.N.W. from Ras Asír, but their existence does not affect this statement, as they are left far distant on the starboard hand in proceeding along the northern coast of Africa.

Chart 1012, Arabian Sea.

the Laccadive group, and from thence proceed as described from Bombay.

From the Seychelles and Zanzibar to Aden and the Red sea, during the South-west monsoon, small-power steam-vessels take the direct route.

In the North-east monsoon, small-power steam-vessels also take the direct route from India or the Persian gulf to the Gulf of Aden and the Red sea; but, if from Zanzibar, a vessel of this class should proceed through Pemba channel to take advantage of the favourable northerly current, as far as about lat. 3° S., or near Lamu, from whence she may gradually steer towards the equator and on to the Seychelles on the port tack.

From the Seychelles, the westerly monsoon will take her, with a leading wind, to the equator, which should be crossed in about long. 61° E.; from thence, steaming to the northward, the wind will gradually haul through north to north-east enabling the vessel, with steam and sail, to fetch Ras Asír from about lat. 6° N.

Having passed through the Straits of Bab-el-Mandeb, the track for small-power steam-vessels up the Red sea is the same as that for those of full-power, though, if desired, and if northerly winds should be strong, which is rarely the case in the southern part of the Red sea, the Massawa channel may be taken. It is especially worthy of notice that, in entering the Gulf of Suez against the strong north-westerly winds often prevailing there, vessels of this class may gain considerably by using one of the channels westward of Shadwán; these channels, however, can only be taken by daylight, but there are plenty of good anchorages in them if overtaken by night; they are fully described at pages .

Chart 2523, Red Sea.

SAILING VESSELS.—Red sea.—Though the Red sea or Gulf of Aden are rarely visited by sailing vessels, occasions may occur when the following directions may prove useful:—

For sailing vessels, the most favourable part of the year for the outward voyage to India, through the Red sea is from June to September, or the period of the South-west monsoon in the Arabian sea, as northerly winds of variable strength then prevail throughout the whole length of the Red sea. For the return voyage by the same route, December, January, and February are the best months, as the southerly winds often carry a vessel as far as the parallel of Jidda, and sometimes

Chart 2523, Red Sea.

as far as that of Koseir, or even, at times, to Suez itself. *See* note on page 10. After losing the southerly wind, a vessel will have the northerly wind to beat against.

In working to windward in the central channel, a vessel cannot do wrong by keeping the Arabian shore on board, but should not stand close in with a light wind or heavy swell. After dark she ought only to stand towards the shore half the distance she stands out, and should never come nearer than 10 miles to the reefs at night, to guard against the possibility of mischance from the unexpected existence of a cross current. *See* page 23. And even, if over on the western shore so far northward as Koseir, and bound for Suez, with a strong northerly wind, a vessel ought to stand over to the Arabian coast, where she will probably fetch Mowila (*Lat. 27° 04′ N., Long. 35° 27′ E.*). Having worked up 30 miles northward of that place, she may stand over to Ras Muhammed, leaving the Arabian coast at night. As she proceeds, the northerly winds will veer to north-north-east out of the gulf of Akaba; by keeping as close a luff as possible, these will enable her to fetch Ras Muhammed.

At Bab-el-Mandeb, a sailing vessel should, if possible, always pass through the Small strait, as in case of need, there is anchorage in any part of it.

Chart 1012, Arabian Sea.

OUTWARD BOUND. — South-west monsoon. — Sailing vessels, bound to Bombay during the South-west monsoon, on leaving the Straits of Bab-el-Mandeb, should either keep in the centre, or towards the Arabian shore of the Gulf of Aden, in order to avoid the westerly current on the African shore; and on reaching the South-west monsoon outside the gulf should steer a direct course for Bombay.

Vessels bound to Ceylon or the Bay of Bengal during this monsoon, *i.e.*, from April to October, should always pass northward of Sokótra in order to avoid the heavy cross seas prevailing southward of it at this season. At all seasons, however, it is advisable to pass northward of it, if Abd al Kuri would have to be made at night, as the current there is often setting strongly northward. Having cleared the eastern end of Sokótra, a vessel should shape course to pass through the Eight Degrees or Nine Degrees channel, or on either side of Minikoi island light.

Vessels bound to the Persian gulf will find the South-west monsoon strong along the whole extent of coast to Ras Al-Hadd, except very near the shore when north-eastward of Khorya Morya bay, where the wind is liable to fall light at night.

General charts 2523, 748b.

Chart 1012, Arabian Sea.

Those bound to Seychelles, having passed northward of Sokótra, should stand away on the starboard tack, crossing the line, if possible, in about long. 72° E.; from thence working into the South-east trade, which should be met with in lat. 2° to 4° S., when they may stand for Seychelles on the port tack.

North-east monsoon.—From September to March the passage from the Red sea to India or the Persian gulf is very tedious for sailing vessels, and is now seldom attempted. In former times, the passage between Aden and Bombay, when unavoidably taken at this season, frequently occupied from 60 to 90 days.

Vessels leaving the Red sea for India or the Persian gulf during these months should work along the Arabian coast, taking advantage of every shift of wind. Should the current be strong in-shore, it is better to stand out 60 or 80 miles from the land, but should the wind be light, advantage should be taken of the tides and land winds in-shore, anchoring when requisite. The current generally sets westward, but sometimes sets to windward for three or four days together about the full and change of the moon. When off the Khorya Morya islands, or farther north-eastward, if she can get there without much difficulty, a vessel may stand to the south-eastward, as the wind will draw to north or westward of north, as easting is made, enabling her to lay her course for Bombay.

Chart 748b, Indian Ocean—Northern Portion.

HOMEWARD BOUND.—From Bombay.—South-west monsoon.—It is usual after the setting in of the South-west monsoon for sailing vessels bound from Bombay to Aden and the Red sea to make what is called the southern passage, or to run down southward of the equator into the South-east trade to make their westing. After working out of Bombay harbour into 15 or 20 fathoms water, a vessel may steer down the coast, keeping in from 40 to 50 fathoms; this is advisable to keep clear of the Laccadive group, in the thick overcast rainy weather that may be expected, when observations may not be obtainable for days together. After passing these islands, as little easting as possible should be made, as the South-east trade is fallen in with sooner to the westward than to the eastward. The wind will be from south-west to west-south-west with hard westerly and west-north-westerly squalls accompanied by heavy rain. A south-south-east current of from 20 to 30 miles a day will be experienced.

As the equator is approached, the weather becomes finer and the wind more moderate; and, on the equator, light airs and calms, with cloudy weather, and possibly rain, may be experienced. This weather will continue until the South-east trade

Chart 748b, Indian Ocean, Northern Portion.

is fallen in with, which is generally in from 5° to 6° S. latitude, but it varies; it is sometimes met in 1° S., at others not northward of 8° S. or even 9° S. latitude. Vessels may run down their westing when fairly in the trade wind, but they are generally obliged to pass southward of the Chagos archipelago.

On getting the South-east trade, a course should be shaped to pass about 100 miles north-eastward of the Seychelles islands, which may be sighted, for a fresh departure. The equator should be recrossed on the meridian of 53° or 54° E. The trade wind will be steady and strong, with fine weather, and carried as far as the equator, gradually veering to south and south-west, continuing moderate until in about lat. 4° N., when the South-west monsoon will increase, and reach its greatest force in about 10° N.

After crossing the equator, a course should be shaped to make the African coast between Ras Hafún and Ras Asír, due allowance being made for the strong north-easterly current which will be experienced on nearing the coast. *See* pages 26 and 44.

After rounding Ras Asír (*Lat. 11° 50′ N., Long. 51° 16′ E.*), vessels should keep the African shore aboard until Burnt island is reached, when they should steer for Aden. Beating along the African shore against strong westerly and west-south-westerly winds is sometimes tedious, but a vessel should persevere, as she is more likely to get to the westward thus than in the middle of the gulf or on the Arabian shore.

Vessels should have good sails bent, for the wind frequently blows in severe gusts along the African coast.

A fast sailing vessel may work up from Aden to the Straits of Bab-el-Mandeb during the South-west monsoon if every advantage is taken, particularly at springs, when the current is liable to change and sets westward; the wind, at such times, is also subject to small changes; or, in these months, a quick passage may sometimes be made by keeping near the African shore until about 60 or 70 miles westward of Burnt island and then crossing over for the straits, or as near to them as the wind will admit.

From the southern ports of India, sailing vessels bound to the Red sea should stand southward into the South-east trade, and then proceed as from Bombay.

From the Persian gulf, the route is westward of the Laccadive group into the South-east trade, then proceed as from Bombay.

From Zanzibar and Seychelles, sailing vessels may steer direct for Ras Asír, and then proceed as from Bombay.

General chart 748b.

Charts 1012, Arabian Sea.

North-east monsoon.—From November to the end of February, a sailing vessel from Bombay, or any other port on the western coast of India, should steer a direct course to pass between the Arabian coast and the island of Sokótra, and afterwards to fall in with the land about Aden, paying attention to the lead. In these months the North-east monsoon blows fresh, especially westward of Sokótra, and a quick passage may be anticipated.

In March and April, the winds are less constant in the Arabian sea than in the four preceding months, and there are calms at times. In these months, a vessel should steer to pass southward of Sokótra; for, early in April, the North-east monsoon is nearly expended about this island and on the coast of Arabia, and is succeeded by light breezes from south-west and west, with frequent calms. The current also begins to set strongly to the northward about Sokótra, and between it and the coast of Africa. About and from the latter end of March, therefore, it is advisable to pass about 50 miles southward of that island, in order to fetch Ras Asír with the south-westerly winds which may then be expected.

Leaving Bombay late in April, a vessel should shape a course to pass well southward of Sokótra, in order to make the coast of Africa southward of Ras Asír with the south-westerly wind, which she will probably meet with long before that shore is approached. The land may then be made anywhere between Ras Hafún and Ras Asír, and the remainder of the passage be made as directed for the South-west monsoon.

In November, December, January, or February, sailing vessels bound to the Red sea from Cochin, Calicut, or other ports on the southern part of the Malabar coast, may steer directly westward through the most convenient channel among the Laccadive islands. Those from Cochin should pass southward of Suheli-par, keeping in about lat. 9° 30′ N.; but vessels from Mangalore or Kannanur should pass northward of all the islands. In March and April, the prevailing winds between the Malabar and African coasts being from north to north-west, it is better to keep near the Malabar coast until northward of mount Dilli, and to pass northward of the islands; or, if the Nine Degrees channel is adopted, vessels should pass near Kalpeni and Suheli islands, as the current sets southward towards the Maldive islands in these months.

When clear of the islands, in November, December, January, or February, a course may be shaped to pass on the northern side of Sokótra; but late in March or early in April, it is prudent to keep more to the southward, in lat. 9° or 10° N. as the wind may admit; and, in May, when the South-west

Charts 1012, Arabian Sea.

monsoon may be expected, it is advisable to keep well to the southward.

From Zanzibar (November to March), a sailing vessel should work to the eastward into the North-west monsoon keeping as far northward as the wind will permit until that monsoon is reached; then run east, edging northward at the latter part, as far as about long. 68° E., when stand northward into the North-east monsoon and from thence direct for the Gulf of Aden. The same route may be taken from the Seychelles.

Sokótra should be weathered if possible. If efforts are only made to pass southward of it, and the monsoon happens to be fresh, there is a great chance of being swept to leeward of Ras Asír. If leaving Zanzibar in March, a vessel should not go eastward of the Seychelles before standing to the northward, as southerly winds might be expected before reaching Ras Asír.

General chart 748b.

CHAPTER II.

PORT SAID—SUEZ CANAL—BAY OF SUEZ.

VARIATION IN 1909.—Decreasing 4′ annually.

Chart 2573. Damietta to El Arish.

GENERAL REMARKS.—Approaching Port Said.—The coast in the neighbourhood of Port Said is unusually low, being out of sight when 3 miles distant. The lighthouse, town, and shipping are the only objects seen from the offing. At 6 miles westward of the lighthouse the coast is marked by Fort Ghemil, a low building standing by itself on the low sandy shore. Between Fort Ghemil and the Arab village of Port Said, are two beacons on the coast about 2 and 4 miles eastward of Shemil, each in the shape of a column, painted black and white, and surmounted by a ball. The lighthouse, and the two water towers (98 feet high, red, skeleton-shaped, with conical tops) at Port Said are conspicuous, and so is the Eastern Exchange, a large square red block building with five flag-staffs on its roof; also the offices of the Canal Company. The latter is a white square stone building with three domes. On the shore, about 3 miles eastward of the lighthouse, is a beacon, 17 feet high, in the shape of a column, painted with black and white bands, and surmounted by a staff.

Current.—The current off the coast is very uncertain. It generally runs with the wind, from half a mile to 1½ miles an hour. The general set is eastward. Owing to this and the low coast, more than usual caution is necessary in approaching the port.

CAUTION.—Vessels of war should be careful when firing salutes to do so when well clear of the outer light-buoys. The gas-lights have frequently been extinguished and the buoys damaged for want of this precaution

Plan 234, Port Said.

Outer anchorage.—The best anchorage off Port Said is, in 5½ fathoms, with the extreme of the West breakwater in line with the High lighthouse, or a little open on either side of the lighthouse. The bottom is mud and very good holding-ground.

General charts 2573, 2630.

Plan 234, Port Said. Var. 3° 0′ W.

PORT SAID HARBOUR (*High Light, Lat. 31°15′45″ N., Long. 32° 18′ 45″ E.*) is formed by two concrete breakwaters extending from the sandy shore. A good straight channel, at least 60 yards wide at its narrowest part, and having 31 feet water, leads from the roadstead to and through the inner harbour, or Ismail basin, which has a similar depth; in the fairway dredging operations to maintain and increase the depth are always in progress. The West breakwater, 1⅓ miles in length; for a distance of 427 yards from its root, it consists of solid masonry, with the exception of a short length, situated at about 600 yards further out, also of solid stone-work, the remainder is constructed of blocks of concrete thrown down indiscriminately. The outer end for about 600 yards being awash. Great interstices thus occur, and in winter after heavy gales some blocks are liable to displacement, but these are replaced in the summer.

The East breakwater is about one mile long and it is to be extended about 500 yards in the same direction towards the edge of the entrance fairway. The end of the works will be marked by a buoy exhibiting a *red* light. The buoy will be moved as the work progresses and should be left to the southward.

Central mole.—A mole 3 cables long affords additional protection to vessels moored in the port. It starts from near the shore and extends parallel with the East breakwater into a depth of 12 feet on the eastern side of the fairway.

LIGHTS.—Port Said High lighthouse (*Lat. 31° 15′ 45″ N., Long. 32° 18′ 45″ E.*), a grey octagonal concrete tower, stands close to the in-shore end of the West breakwater; from it is exhibited, at 184 feet above high water, a *flashing white electric* light every *ten seconds*, visible in clear weather at 20 miles. It is visible from S. 74° E., through south, and west, to N. 52° W. The lighthouse, being surmounted by the iron lattice-work mast is an excellent beacon by day.

LIGHT-BUOYS.—Approach.—The number and positions of gas-light buoys marking the approach to Port Said channel are subject to alteration, but *red* lights always mark the port hand in entering, and *green* lights the starboard hand. At present (1908) the two outer approach buoys are about 14 cables north-eastward from the West pier-head, and are 2¾ cables apart.

West breakwater.—A light-buoy showing a *green* light is moored about half a cable north-eastward of the submerged

Plan 234, Port Said. Var. 3° 0′ W.

extreme of this breakwater. About 3 cables E. by N. ¾ N. from it, on the eastern side of the channel, is a light-buoy showing a *red* light.

Two other pairs of light-buoys mark the narrow part of the channel between the outer and inner ends of the West breakwater.

Central mole.—At the northern end of the jetty, on the eastern side of the entrance to Port Said, is exhibited a *red fixed* light at 21 feet above the sea, visible 3 miles. This light is unwatched.

By passing between the outer light buoys, vessels bound to Port Said can, the more readily, steer for the main entrance channel, and make proper allowance for the current.

Lake light (*Lat. 31° 15′ N., Long. 32° 18′ E.*).—At rather more than one mile S.W. ¾ S. from the High lighthouse, and on the western side of the African basin, is a black wooden lighthouse, from which is exhibited at 62 feet above high water, a *fixed red* light, visible 8 miles through an arc of 22°, between S. 30° W. and S. 52° W.; the centre of this arc indicates the mid-channel course into Port Said.

Occasional lights.—To aid the navigation of the Canal by night, lights are shown occasionally from the look-out at the Canal Company's office; they consist of one *red* and either one or two *white* lights, the *red* light being either shown alone or placed below the *white* light or lights; they are visible 8 miles to seaward as well as from the Canal.

Anchor lights.—Ships made fast in the harbour at Port Said, at right angles with the axial line of the Port, must show a *white* light as nearly as possible at the extreme end of the ship nearest the navigable channel, at such a height that it may be clearly seen by passing ships.

Mooring buoys.—Several sets of mooring buoys are laid down in the harbour for the use of the numerous mail steamers.

Tides.—It is high water, full and change, at Port Said at about 10h. 0m.; rise, from 6 to 18 inches; the range is much affected by wind and sea.

Variation of sea level.—Besides the tidal range, the Canal officials report that the height of the mean sea level at Port Said varies with the seasons. Thus, in February, after the usual continuance of westerly, southerly, and south-easterly

Plan 234, Port Said. Var. 3° 0′ W.

winds, the sea is at its lowest level, and in July, after a continuance of northerly winds, it is at its highest. The mean difference, however, due to these causes does not exceed 8 or 9 inches. Northerly gales occasionally raise the level one foot, and, in rare instances, 2 feet, above the previously existing level. During a period of six years, the difference between the highest and lowest levels observed amounted to 4½ feet.

The mean sea levels at Suez and Port Said are identical. The difference in level between ordinary high and low water at Suez is 3 feet 9 inches; at Port Said 9 inches. The extreme difference caused by contrary winds observed at Suez is 8 feet 6 inches, and at Port Said 4 feet 6 inches. The prevailing winds are from north and north-west.

DIRECTIONS.—The Lake lighthouse, kept midway between the lines of *red* and *green* gas light-buoys, marking, respectively, the eastern and western sides of the channel, bearing S. 40° W., leads to the entrance; from thence steer in mid-channel between the lines of light-buoys, where (in 1908) there is reported to be nothing less than 31 feet water. Vessels in the port are required to moor head and stern.

CAUTION.—No deep draught vessels should attempt to enter Port Said during a westerly gale, especially at night. If compelled to do so, however, a vessel should point for the entrance when well outside the outer light-buoys and proceed in at a speed of 9 or 10 knots, keeping close to the western buoys until under the lee of the West breakwater, when the speed should be slackened and a pilot taken on board. In strong westerly winds, the current rushes past the outer end of the West breakwater across the channel, sometimes at a rate of 4 knots; under the lee of the breakwater, a weak stream then sets north-eastward.

Signals and pilots.—Approaching vessels are signalled from the signal station, which is at the central dome of the Canal Company's office; when first sighted, a square blue flag is hoisted, and when made out, if a man-of-war, her national ensign is hoisted at the yard-arm, and if a merchant vessel, the house flag. All vessels measuring over 100 tons are bound to take a pilot. The pilot boats carry flag S of the International code. By night, the Canal Company's pilot vessel carries three *red* lights vertical at the masthead.

The pilot flag should be hoisted when a pilot is wanted to enter the harbour in the day time; this will be answered from the Canal Company's signal station by red pendant. By night, the signal is, lights at the fore-topmast-head, followed either by

Plan 234, Port Said. Var. 3° 0′ W.

rockets, blue lights, or guns. This will be answered from the signal station :—

If by a rocket	- -	Pilot is going out to you.
If by a blue light	-	Pilot cannot go off to you.

When pilots cannot board vessels outside, they sometimes wait to do so under shelter of the breakwater or occasionally come out in a tug and guide them in. In the latter case, the tug makes the signal "Follow me" and steams ahead of the ship; too much reliance should not be placed on this, as the pilot may not know the vessel's draught. It is then for the captain's consideration whether the draught of his vessel admits of his following the tug with safety.

Ships in the port requiring a pilot hoist three lights at the fore-topmast-head; they must give previous notice of their intention of leaving the port.

Remarks affecting silt at Port Said.—The littoral current from the mouths of the Nile travelling eastward receives a check on striking the West breakwater of Port Said; part of it becomes diverted northward and passes round the head of the breakwater, whilst a considerable portion used to find its way through interstices of the loose blocks composing the breakwater, and, arriving in still water, a deposit of sediment took place, and a bank of sand was thus formed along the inner side of the breakwater.

This bank gradually increased until, in the year 1886, there was only about one foot of water where there had been formerly from 13 to 16 feet; the interstices in the breakwater between the blocks became closed up with sediment, and the current ceased to pass through, and the only matter held in suspension that escaped into the channel was such as was washed over the breakwater during the heavy gales. A far greater amount of deposit, therefore, now took place along the shore, and a rapid advance of the coast line seaward was the consequence. Where the English hospital is built there was formerly a depth of 7 feet.

There is now a broad road running parallel with the sea in front of the English hospital, and a sandy beach beyond, which was about 50 yards wide in 1897, and increases in width continuously every year.

Dredging was carried out in 1887 to clear away the bank formed within the breakwater, and as a result it is again permeable, the current having forced its way through and the advance of the coast-line partially stopped. The filtration of the sediment takes place at a considerable depth below the surface.

General charts 2573, 2630.

Plan 234, Port Said. Var. 3° 0′ W.

Basins.—Ismail basin, or the port proper, is an artificial basin, sub-divided on the western side into three smaller ones, named, respectively, Commercial, Arsenal, and Cherif, and all opening into the port. The outer, or Commercial, basin had a depth of 19½ feet, the Arsenal basin 19½ feet, and the Cherif basin from 22 to 24 feet; but great alterations are in progress and it is said that by the year 1911 the harbour will have more than doubled in size.

A large basin is now being dredged on the eastern side of the Canal for the use of colliers and petroleum ships. When this is completed, the Africa basin will be available for the general trade of Egypt. The Cherif basin is also being doubled in size and is to be deepened to 30 feet, with wharves and warehouses in proportion.

Four bollards are placed on the British Admiralty ground on the southern side of the Ismail basin.

The Africa or Abbas basin is southward of the Admiralty ground on the western side of the Canal entrance, and has hitherto been chiefly used by the vessels staying some time in port, thus relieving the portion in front of the town from inconveniently crowding. The general depth in this basin is 28 feet.

There are two black mooring buoys on the eastern side, opposite the Admiralty ground, for vessels carrying explosives.

Special area for petroleum vessels.—On the eastern bank, opposite the Africa basin, is the small basin, hitherto used by vessels laden with petroleum, to be superseded by the larger basin now under construction; the entrance is protected by iron floating booms. There is a depth on the floor of this basin of about 28 feet. At the southern end of the Africa basin also is a space protected by booms for mooring petroleum vessels.

Caution.—The Canal Company do not dredge in or round the harbour except in the channel and basins, the depth is therefore liable to alter, and too great reliance should not be placed on any soundings shown on the plan

The town stands on the western side of the port and is well laid out, the streets being planted with trees; it is lighted with gas, but many large houses have electric light. The place has been considerably improved of late years, new Government offices, barracks, prison, Roman Catholic church, and offices for the Suez Canal Company having been built. There is an English hospital, Egyptian Government hospital, a sailors' boarding house and sailors' rest.

General charts 2573, 2630.

Plan 234, Port Said. Var. 3° 0′ W.

Parallel with the railway line between Port Said and Ismailia, is a fresh-water canal.

A large area by the cemetery and Arab town, and also southward of Ismail basin, has been reclaimed from lake Menzaleh. Extensive works of reclamation are always in progress in this vicinity.

Population.—The population of Port Said is steadily on the increase; according to the census report of 1897, the number had then risen from 19,000 in 1882 to 43,000. Nearly three-quarters are natives, the majority being engaged in loading and discharging coal; the remainder, about 11,000, are Europeans of almost every nationality.

Consulate.—A British Consul and Vice-Consul resides here.

Coal and supplies.—Coal can always be obtained in abundance, and is placed on board in the most expeditious manner, from special lighters, the natives employed keeping up a quick and continuous stream with their coal baskets. Coal can be put on board at the rate of about 500 to 600 tons per hour. Coaling is rarely impeded by the weather. Vessels are not coaled alongside a wharf, the moorings for ships being 30 yards from the shore. The amount of coal imported at Port Said in 1896 was 1,205,000 tons, and the quantity in stock averaged about 104,000 tons, but it is said that the reserve stock both on shore and in lighters is at times not more than enough for a week's supply

Water.—The supply of water is now excellent. The source of supply is the Sweet water canal, and there is no difference between summer and winter. The Canal Company's filter beds treat daily 2,000 tons of water. The waterworks and reservoirs are at the entrance of the Canal, and here, with a few days' notice, on November 24th, 1904, twenty-one Russian ships were supplied with 3,900 tons of water. It is conveyed to ships by steam water tanks, fitted with their own steam pumps.

Other supplies are in abundance and there is a good manufactory for making block ice.

Trade.—The principal articles of export are cigarettes and cotton, the value of the latter being only one tenth that of the former, the value of the cigarettes far exceeding the total of all other exports. The principal imports are wood, coal, flour, spirits, metals, building materials, machinery, ship chandlery, frozen meat, and petroleum. The number of vessels entering the port in 1906. exclusive of those passing through the canal,

Plan 234, Port Said. Var. 3° 0′ W.

was 1,249 with a total tonnage of 1,413,701; of this total about half was British tonnage.

Repairs, except large castings, can be executed by the Suez Canal Company, who possess three floating cranes of 35 tons, respectively, also an 8-ton and two 3-ton floating sheers, and an 8-ton land crane, with a large smithy and steam hammers of 1½ and 4 tons; also, a water-side frontage to their works of 450 yards, with not less than 19 feet alongside at low-water. Castings up to 3 tons have been made, cylinders of 60 to 72 inches diameter cast and bored, and shafting of 12 inches by 15½ feet forged and turned. Messrs. Downie and Co. have a water frontage of 82 yards with about 5 feet alongside and only 30 yards from the main channel; they are able to execute repairs of large engines and boilers, &c. Their works are in process of changing site from the western to the eastern side of the Canal entrance, to make room for further dredging. Messrs. Vignette and Co. are also able to effect heavy repairs; they have several lathes, also one 8-ton and two 3-ton floating sheers.

Floating dock.—There is a floating or pontoon dock in the Arsenal basin at Port Said belonging to the Canal Company it has a lifting capacity of about 3,000 tons and a length over all of 295 feet; width of entrance 61 feet, and depth on blocks 18 feet. There are also two patent slips, 150 feet in length on cradle, which can receive vessels of 300 tons, and 20 slips for lighters.

Communication.—Port Said is in communication with all parts by steamer and electric telegraph, and it is connected with Ismailia by a railway of the ordinary gauge of the country, and though intended specially for the conveyance of passengers, mails, &c., is now part of the Government railway system and no longer belongs to the Canal Company. Ismailia being also connected by railway with Suez and Cairo, is an important point on that system.

A channel has been dredged across lake Mehzaleh and a service of steam ferry boats established between Port Said and Matariah, the eastern point of the fertile province of Mansourah; the passage occupies about 3 hours.

A wireless telegraph station is established at port Said. The call letters are P.D.

Quarantine.—Plague.—The presence of the first case of bubonic plague at Alexandria was officially declared on May 21st, 1899; it was followed by many others and the visitation lasted through the summer. Until this, Port Said had been entirely

Plan 234, Port Said. Var. 3° 0′ W.

free from disease; but now, the quarantine regulations at European ports on all arrivals from this country apply to Port Said as well as to Alexandria. Vessels are free to pass through the Canal in quarantine, without communicating with the shore, and most of the large mail steamers, as well as many cargo steamers, now do so.

Vessels intending to pass through the Canal in voluntary quarantine should hoist two yellow flags at the foremast head by day, and two *red* lights, *vertical*, by night. These signals should remain hoisted during the transit of the Canal and until clear of Port Said or Suez as the case may be. The Canal pilot is disinfected and remains on board the whole time.

The quarantine station is on the eastern bank of the Canal between the second and third milestones. There is also a floating quarantine office in the Africa basin.

Time signal.—As before stated (*see* page 6), the standard time adopted throughout Egypt is that of 30° E. of Greenwich, or 2 hours fast on Greenwich mean time. The time signal is made from a lattice-work iron mast, 30 feet high, erected above the light on the top of the High lighthouse; here a black ball is hoisted, as preparatory, 5 minutes before the signal, thrice daily viz.:—

At 8h. a.m. standard time	=	18h. 0m. 0sec. G.M.T.
At noon, ,, ,,	=	22h. 0m. 0sec. G.M.T.
At 4h. p.m. ,, ,,	=	2h. 0m. 0sec. G.M.T.

Should the signal fail, a red and white chequered flag is shown from the top of the lighthouse, but the signal is not repeated until the next regular time for making it arrives. The signal is electrically connected with Cairo.

Vessel's chronometers can be compared at any time by application at the Port office.

CAUTION.—Ships are forbidden to sound sirens in any part of the port, and steam whistles are only to be sounded as alarm signals in cases of serious danger. Ships are kept waiting half an hour for a pilot each time of blowing a steam siren or whistle, besides being subject to a fine for a breach of regulations.

Salutes.—Men-of-war are requested not to fire salutes or guns in any part of the port or Canal, according to regulations. Salutes are permitted outside the harbour, but *see* Caution, page 52. Ships saluting the Egyptian flag on entering or leaving the port will have the salute returned by the battery on the shore near the West breakwater.

General charts 2573, 2630.

Plan 234, Port Said. Var. 3° 0′ W.

Winds.—South-west gales are the heaviest experienced at Port Said, but being off-shore they produce no sea. West, north-west and north winds are the prevailing winter winds at Port Said and in the Canal; the west breakwater at the former place affords protection from the sea. During the summer, the sea breezes (from north-east) are very regular, and blow fresh in the afternoon.

In lake Timsah, during the summer months, the prevailing winds are from north-north-west to north-east.

Barometer.—According to observations made during a period of 14 years, the mean annual height of the barometer at Port Said is 29·93 ins; the mean monthly height in December (the highest) is 30·04; in July (the lowest) 29·76.

Thermometer.—The mean annual temperature at Port Said is 70°·8. The mean monthly height in January (the lowest) is 58°·1, in August (the highest) 82°·6. The maximum height is recorded as 106°·5 in July, and the minimum as 39°·9 in February.

During August and September, 1882, the temperature in lake Timsah by day was from 92° to 98°, by night from 76° to 82°. There were dense fogs in September.

Rainfall.—The average annual rainfall for 10 years is 3·23 inches. The greatest rainfall was in December, when 1·1 inches fell. During June, July, August, and September there was no rainfall.

Plan No. 233. Plan of Suez Canal.

SUEZ MARITIME CANAL.—General information.—The Suez canal was first opened to traffic on November 20th, 1869. By an international convention, signed October 24th, 1887, it was declared neutralized. It is exempt from blockade, and vessels of all nations, whether armed or not, are allowed to pass through either in peace or war.

The entrance (*Lat. 31° 16′ N., Long. 32° 19′ E.*) is conveniently situated at the inner end of the basins, at Port Said, and its whole length, from the High lighthouse at Port Said to its junction with the Red sea at Suez, is as nearly as possible 87 miles. Of this distance 66 miles are actual canal, and 21 miles of the navigation runs through Lake Timsah, and the Great and Little Bitter lakes. Dredging had to be carried out throughout the whole length of lake Timsah, of the Little

Plan No. 233. Plan of Suez Canal. Var. 3° 0′ W.

Bitter lake, and of a portion of the Great Bitter lake, leaving a distance of only 8 miles in the latter, where the natural depth exceeded that of the canal, and where, consequently, no dredging was necessary.

Width and depth.—The width of the canal at the surface varies, but throughout the greater part of its length is about 320 feet; where the banks are high it is 190 feet, where the banks are low the breadth expands to 330 feet. The narrows occur in the neighbourhood of El Guisr, Serapeum, and Chalouf, and are respectively 8, 5½, and 4 miles in length. Many of the former sharp turnings have been widened, and new gares or sidings, 2,460 feet in length and 49 feet broad, constructed. The width of the floor (originally 72 feet) has been increased throughout to 121 feet, and in 1908, the general depth throughout the main navigable channel of the Canal was nowhere less than 31 feet. From January 1st, 1908, vessels of 28 feet draught were permitted to pass through. The work of widening the canal floor from 72 to 121 feet having been completed in 1898, and since then ten supplementary gares having been provided, it is intended during the next four or five years to widen the southern portion of the Canal from El Ferdane, 34 miles from Port Said, to Suez, a distance of 53 miles, from its present width of 121 feet to 148 feet. This work is now in progress.

With respect to depth, it may be added that during the above-mentioned period, the Company hope to obtain a depth of 34½ feet throughout the whole length of the Canal, which will afford a safe passage through to vessels up to 31 feet draught.

Much larger vessels than formerly now use the Suez Canal with facility, employing a tug ahead and using their own steam. Many battleships of all navies have passed through, and as early as 1896 the s.s. *Friedrich der Grosse*, 525 feet in length, accomplished the passage. Vessels of the Peninsular and Oriental Steam Navigation Company, 500 feet long, 54 feet beam, and of the maximum draught allowed, are continually passing through the Canal, and nearly all the shipping using the Canal make part of their passage through by night.

See also page 80 under Directions.

Buoys, &c.—All beacons and buoys marking the deep water channel of the Canal are coloured; black with white tops on the eastern side of the channel, red on the western side. When rocks occur at the edge of the channel, they are marked by small nun buoys with staff and cage.

General chart 2523.

Plan No. 233. Plan of Suez Canal. Var. 3° 0′ W.

Mooring bollards are fixed in the banks of the Canal about a cable apart; they will bear sufficient strain to cant the largest ship. In the event of getting hard aground, the best shore anchor is found to be a spar buried horizontally on the inner side of the bank with perpendicular planks in front, the hawser being led through a cutting. Many gares are provided in the Canal, and at each one there is a signal station.

Transit by night has been allowed since March 1887, and the system of leading lights, light-buoys, and beacons, is admirable. Vessels proceeding at night must be provided with an electric light fitted in accordance with the Company's requirements; the majority of vessels obtain the light apparatus from one of the different shipping agents at a uniform rate of 10*l.* for the transit. *See* page 72.

The introduction of the electric light had the effect of virtually doubling the carrying capacity of the Canal. In 1898, 94 per cent. of the total shipping made part of their passage by aid of the electric light, the average duration of their transit being 17 hours 22 minutes; the least time taken was 16 hours 36 minutes; whereas the average time taken by steam-vessels navigating by day only was 28 hours 20 minutes.

The Canal lights comprise *white* leading lights at the ends of reaches, and at intervals on the banks when the straight portions are long; and *coloured* lights at the curves to guide vessels round them. *Green* lights are on the eastern side of the channel and *red* lights on the western side.

Traffic.—The number of vessels that passed through the Canal in the year 1906 was 3,957, their aggregate net tonnage, 13,445,504. Of these vessels, belonging to about 20 different nationalities, 61·7 per cent. were British tonnage. If merchant shipping only were considered, the British average is still higher, about 74 per cent. in number and 77 per cent. in net tonnage. Germany comes next with about 14·6 per cent. in number and 16 per cent. in tonnage; whilst Holland, Austria-Hungary, Italy, and Norway between them, furnish a total of 19·1 per cent. in number and 16·7 per cent. in tonnage.

The receipts for 1898 were 3,411,790*l.*, and were higher than in any previous year since the opening of the Canal in 1869. In 1906 they amounted to 4,326,746*l.*

Petroleum vessels.—For distinguishing signals and regulations, *see* page 80.

Fresh-water canal.—A fresh-water canal connects the Nile at Cairo with the Suez Canal at Ismailia, on lake Timsah,

Plan 233. Plan of Suez Canal. Var. 3° 0′ W.

the connection being effected by means of two locks at Ismailia. During the Egyptian campaign of 1882, this canal was used for the conveyance of supplies to the front. About 3 miles before reaching Ismailia, an arm of the fresh-water canal branches off and follows nearly the line of railway and maritime canal to Suez. The depth in the fresh-water canal, which varies with the height of the Nile, is about 4 feet.

A branch from this canal has been constructed from Ismailia to Port Said, where the water for consumption is passed through filter beds. The northern portion of the Suez Canal and the town of Port Said itself, are thus supplied from Ismailia, the water being forced by steam machinery through a double row of pipes along the banks of the Canal.

GENERAL DESCRIPTION.—Port Said to Kantara (*Kantara, Lat. 29° 52′, Long. 32° 19′ E.*).—The whole of this distance, 24$\frac{1}{6}$ miles from abreast of Port Said high lighthouse, with the exception of but one-sixth of a mile, where the ground is higher, the Canal runs through what was formerly the bed of lake Menzaleh, which is now, on the eastern side, a dry flat sandy plain, scarcely higher than the level of the water; on the western side it is a little below that level, and, with a "high Nile," is completely overflowed. The débris thrown up on the banks here is firm black sandy mud, protecting the Canal from the water in lake Menzaleh without any opening in the whole distance.

From Kantara to Lake Ballah is 2$\frac{1}{4}$ miles.—The Canal passes through sand-hills from 20 to 30 feet high.

From the northern end of Lake Ballah to the leading light beyond its southern end, is 7 miles.—The Canal here passes through a lagoon; the débris on either side is of fine sand.

Lake Ballah to Lake Timsah.—From the leading light southward of Lake Ballah to Lake Timsah is 7$\frac{1}{2}$ miles. In this cutting the sand-hills are about 40 feet high. For about 4 miles in the neighbourhood of El Guisr, the Canal is cut through strata of soft limestone or sandstone. The sharp turns between El Guisr and Lake Timsah are probably owing to the engineers having followed the softest part of the rock; some of these curves have been considerably reduced of late years by cutting away the more prominent parts of the shore. Ships can pass round the curves under their own steam.

General chart 2523.

Plan 233, Plan of Suez Canal. Var. 3° 0′ W.

Ismailia *(Lat. 29° 36′ N., Long. 32° 16′ E.)*, on Lake Timsah, a town with a population of 7,000, and the central station in the Canal, is well situated for a stopping place. Off the town is anchorage space for a large number of vessels. There is a depth of 31 feet in the middle of the lake, in a gare sufficiently large for any ship to turn round in. Vessels of 28 feet draught can anchor in this space, whilst those of 20 feet draught can anchor close in to the pier.*

Ismailia is connected by railway with Suez and Port Said; also with Cairo, and thus with the general railway system of Egypt.

Lights.—On the north shore of the lake, from a red pillar on the beach southward of the town, is exhibited at 33 feet above water, a *fixed red* light, and on an islet on the western shore of the lake, at 31 feet, another *fixed red* light; the channel through the lake is well marked by the usual light buoys. The channel here curves through an arc of about 90°, a ship entering the lake from the northward on a S.W. by W. course, and leaving it on a S.E. by S. course.

Through lake Timsah to Toussoum, 5 miles.—The débris banks here, of pure sand, like those in Lake Ballah, are not sufficiently adhesive to form a barrier between the Canal and the lagoons, to keep the silt from running into the channel; the Canal is, however, sufficiently wide to allow dredgers to work without stopping the traffic.

Toussoum to Great Bitter lake, 8½ miles.—In this cutting, the Canal is carried through strata of sandstone, except in one place, a mile southward of Serapeum, where it runs through hard gypsum rock.

The Great Bitter lake, North entrance *(Lat. 30° 26′ N., Long. 32° 21′ E.)*. The dredged channel leading into the lake is marked by two buoys with *green* gas lights on the eastern side, and by two buoys with *red* gas lights on the western side, the two southernmost buoys being at 54½ miles. A gas buoy with a *white* light is moored in the axis of the channel at 55$\frac{8}{10}$ miles; a similar buoy is moored at about the 66th mile at an angle of 33° with the prolonged axis of the

* During the Egyptian campaign of 1882, space for upwards of 125 transports (some being of the largest size) was found in lake Timsah. 100 of the vessels were moored head and stern.

General chart 2523.

Plan 233, Plan of Suez Canal. Var. 3° 0′ W.

channel into the lake at the southern entrance, about 1½ miles northward of the first pair of the dredged channel lights. These two buoys are known as the northern and southern gas buoys. The best water is apparently eastward of the northern buoy and with the southern buoy in line with the gas light white buoy at the entrance to the southern outlet in 31 feet or more water.

Great to Little Bitter lake, 10 miles.—The light-buoys, showing *green* and *red* lights, mark respectively the eastern and western sides of the entrance to this cutting; from thence, the channel is well marked by numerous light-buoys and iron beacons on each side, about eight of the latter to a mile, similar to those at the northern end of the lake.

Little Bitter lake to Port Thewfik, 15 miles nearly.—This part is quite complete with hard banks, and the usual depth at present of 31 feet at low water. At Chalouf, the cutting is carried through sandstone; the débris is hard and lumpy. Southward of lat. 30° 6° N. (one mile South of Chalouf) the Canal passes through sand-hills and it increases in width.

At Madama, the banks are of firm marl or soft clay. From thence to the southern entrance of the Canal the débris banks are sand.

The southern end of the Canal curves south-westward, and extends beyond Suez creek. leaving it, the town of Suez, the dock, gare, and harbour works of Port Thewfik on the starboard hand, and so out into the Gulf of Suez, with not less than 31 feet at low water. A breakwater is carried across the sea face of the bank on the southern side of the entrance, just within the Kad-el-Marakeb shoal.

Plan No. 3214, Ports Ibrahim and Thewfik.

Port Thewfik *(Lat. 29° 56′ N. Long. 30° 33′ E.).*—Port Thewfik was designed to be at the southern entrance to the Canal what Port Said is at its northern entrance; and, accordingly, considerable works have been carried out, though it is doubtful whether the same necessity for a large port will ever exist at this end of the Canal as at the other. Some confusion exists as to the actual name of this port. Previous to the construction of the Canal, the docks and other works here, in connection with the overland route to India were named Port Ibrahim. At the opening of

Plan No. 3214, Plan of Port Ibrahim and Thewfik. Var. 3° 0′ W.

the Canal the Company named their harbour and works Port Thewfik, which name has gradually become most commonly used for the whole of the Canal and dock works, though, as a matter of fact, both are still in official use; probably the true definition is that everything pertaining to the Canal Company is Port Thewfik; and everything belonging to the Egyptian government which includes the North and South basins with the dry dock, Port Ibrahim. The Canal Company's office and signal station is near the middle of the gare of Port Thewfik.

The Canal Company's southern basin is on the north-western side of the Canal at the inner end of Port Thewfik gare; it is 1,100 feet long by 450 feet wide and has a general depth of 16 feet at low water, springs.

For description of Port Thewfik, *see* page 85.

Mooring buoys.—Coals.—Mooring buoys for large ships are laid down off the Canal Company's offices but the chains are reported to be somewhat light for battleships. Coaling is carried on here much more conveniently than in Suez bay and probably ships can safely load to the Canal depth (31 feet) before proceeding down the Red sea.

Light-buoys.—The mouth of the Canal is marked by two light-buoys and by leading lights, the outer pair of light-buoys, between which ships pass in entering or leaving the Canal, being about abreast of the outer end of the breakwater mentioned.

In accordance with the Canal regulations, the light-buoys on the south-eastern side of the channel show *green* lights; those on the north-western side *red* lights.

Occasional lights.—At the Canal Company's offices, occasional lights are exhibited to aid in the navigation of the Canal by night, consisting of one *red* and either one or two *white* lights; the *red* light may be shown either above or below the *white* light or lights. These lights are visible seaward for a distance of 8 miles.

Caution.—Lights are exhibited at the entrance to the basins of Port Thewfik; *see* page 86.

In thick or hazy weather, ships must be careful not to mistake these lights for those of the Canal entrance.

Signals.—Flag S of the International Code signifies that a Thewfik roads pilot is required to make the vessel fast to the buoys of the dock. Flag T denotes that a vessel does not intend making fast to the buoys.

General chart 757.

Plan No. 233, of Suez Canal. Var. 3° 0′ W.

Ships secured to the buoys are not allowed to get under way for the roads before having received a verbal order from the Harbour-master.

Tides and currents.—From November to April, the general set of the current between Port Said and the Great Bitter lake is to the northward; from June to October, to the southward. The strength of the current depends upon any variation in the height of water in the Mediterranean, which may combine with, or change the direction of, the periodical Canal current. The current, as also the height of the tide, lessens as the distance from the Bitter lakes diminishes. The maximum strength of the current is seldom more that one knot, though it varies from half a knot to 2 knots. There is no perceptible tide or current in the Great Bitter lakes or in lake Timsah *(Lat. 29° 36′ N., Long. 32° 16′ E.)*, nor from thence to Port Said.*

The tidal influence in the southern portion of the Canal extends from Port Thewfik to about 4 miles northward of the southern end of the Little Bitter lake, and it is at the latter position that the separation of the salt lake water from the Red sea water occurs.

Between Port Thewfik and Kilometre 133, near the southern end of the Little Bitter lake (mile 72), the periods of the rising and falling tides are as a rule each about 6¼ hours throughout the year; they are subject, however, to occasional variations caused by local weather conditions which may prolong the duration of either rise or fall to as much as 8 hours. At full and change, the tidal stream runs North from 9h. 30m to 4h. 30m., and

* From November to April the River Nile is falling, and from June to October it is rising; these periods coincide with those of the opposite currents in the Canal here described, but there is not sufficient evidence to prove that the Nile causes them.

That there is at times an interchange of water between the Canal and lake Menzaleh is indicated by the fact that in October when, from the overflowing of the Nile, the lake is at its highest and its water freshest, the water in the Canal for about 24 miles from Port Said, or as far as Kantara, is not so salt as that of the Mediterranean. From Kantara to within a mile or so from the entrance of the Great Bitter lake, the density in October is only a little above that of ordinary sea water.

In April, when lake Menzaleh is low and salt, the water in the Canal northward of the Bitter lakes is much salter than ordinary sea water, and even equals in density that of the Bitter lakes until within 7 or 8 miles of Port Said, when there is a sudden decrease in the saltness of the water which brings it to the same density as that of the Mediterranean.—Navigating-Lieutenant J. C. Richards, H.M.S. *Malabar*, 1872.

In December, 1900, the density of the water at Suez was 1·031; and at Ismailia 1·038; and at Port Said 1·027.—Capt H.E. Purey-Cust, H.M.S. *Rambler*.

General chart 757.

Plan 233, Plan of Suez Canal. Var. 3° 0′ W.

South from 4h. 30m. to 10h. 0m. The tidal streams acquire their greatest rate near Madama, about 7 or 8 miles within the southern entrance of the Canal.

From the end of November to the beginning of May, the flood on north-going stream runs for 7 hours, commencing about 2½ hours before high water at the entrance. During strong southerly winds, it runs upwards of 2½ knots, at springs. The ebb stream lasts about 5½ hours and its greatest rate is about ¾ of a knot.

From the end of May to the beginning of November, the conditions are reversed, the flood stream running for 5½ hours only, with a rate at springs of ¾ of a knot, while the ebb lasts for about 7 hours at a rate of about 2½ knots at springs.

During May and November when the waters of the Red sea and Bitter lakes are nearly at the same level, the tidal streams run for about 6¼ hours each way, attaining their maximum strength, seldom more than one knot, at springs, from 10 to 15 minutes after high and low water by the shore. At the entrance the flood stream commences about 2¾ hours before high water.

The stream at the floor of the canal turns from 5 to 10 minutes earlier than at the surface.

The unvarying height of the water in the Bitter lakes is the cause of the lateness of the making of the flood stream at the entrance. That stream cannot run northward until the tide at the entrance has risen above the level of the lakes, some 2½ hours before high water; it then commences to run up and so continues during the latter part of the flood and until the ebb at the entrance has again fallen below the level of the Bitter lakes.

A spring tide rises 6 inches at the southern entrance of the Little Bitter lake, 1½ feet at Chalouf, 2 feet at Madana, and 7 feet at the entrance. With a strong southerly wind in the Gulf of Suez, the water rises from 8 to 9 feet at its head, which then affects the Canal to some extent.

In passing the mouth of Suez creek, allowance should be made for the strong tidal stream setting across the Canal, frequently in the contrary direction of the stream in the Canal.

By starting from the entrance an hour before low water, a vessel should arrive in the Bitter lakes before the flood tide overtakes her, and will have had slack water nearly all the way, and the tidal part of the Canal is best navigated either at slack water or against the tide. Vessels passing through with a following stream must be on their guard against touching the Canal on either side; as, if the bow touches, they are liable to swing across the channel and block the Canal until the stream turns.

General chart 757.

Tidal signals.—*See* page 79.

REGULATIONS for NAVIGATION*.—The following official regulations for the navigation of the Canal are those now (1908) in force; they differ but little from those of ten years ago but have been amended in conformity with improvements in the Canal, lowering of dues, charges, &c.

Art. 1.—On receiving a copy of the present regulations captains of ships bind themselves to abide by, and conform to, these rules in all points, to obey all signals therein mentioned, and satisfy any requisition made in view of the execution of these regulations.

Art. 2.—Transit through the Suez canal is open to ships of all nationalities, provided that their draught of water does not exceed 28 feet English, and that they conform to the following conditions:—

Sailing vessels above fifty tons gross are bound to be towed through.

Steam-vessels may pass through the Canal by means of their own steam power, or be towed, subject to the conditions hereinafter notified.

The towage of steamers through the Canal is not compulsory on the Company and is only undertaken by the Company in so far as they have tugboats disengaged.

Art. 3.—The maximum speed of all ships passing through the Canal is fixed at ten kilometres, equal to $5\frac{1}{3}$ nautical miles per hour.

Art. 4.—Every vessel measuring more than one hundred tons gross must take on board, either for entering or clearing the ports of Port Said and Port Thewfik, or for passing through the Canal, a pilot of the Company, who will furnish all particulars as to the course to be steered.

The captain is held responsible for all groundings and accidents of whatsoever kind, resulting from the management and manœvring of his ship by day or night.

Pilots place at the disposal of captains of vessels their experience and practical knowledge of the Canal; but, as they cannot be specially acquainted with the defects or peculiarities of each steamer and her machinery, in stopping, steering, &c., the responsibility, as regards the management of the ship, devolves solely upon the captain.

* In October 1906, the special instructions were issued by the Admiralty to Commanding Officers of H.M. Ships in regard to payment of Canal dues and the mode adopted by the Canal Company for ascertaining by measurement, if necessary, the tonnage of vessels of war on which the dues should be levied, &c.

Art. 5.—When a ship intending to proceed through the Canal shall have anchored either at Port Said or Port Thewfik, in the berth appointed by the Harbour-master, the captain must enter his ship at the Transit Office, and pay all dues for passage, and, when there is occasion, for pilotage,* towage, and berthing; a receipt is delivered to him, which serves as a voucher in case of need.

The following written information must be handed in by the captain :—

Name and nationality of the ship, to be identified by exhibiting the ship's papers relating thereto.

Name of the captain; names of the owners and charterers; port of departure; port of destination; draught of water; number of passengers as shown by the passage list.

Statement of crew as shown by the muster roll and its schedules. (Sailors occasionally taken on board vessels passing through the Suez canal are not considered as forming part of the crew, and are taxed in conformity with par. 6, art. 11 of the present regulations.)

Capacity of the ship, according to the legal measurement, ascertained by producing the special Canal certificate, or the ship's official papers, established in conformity with the Rules of the International Tonnage Commission, assembled at Constantinople in 1873.

Art. 6.—The Company determines the hour of departure of each ship, and all subsequent stopping and restarting, as well as all other movements of the ship, in such manner as to give full security for the navigation as well as to ensure as much as possible the rapid passage of mail steamers.

Therefore, no ship can demand, as a right, an immediate passage through the Canal; neither will any claim be admitted in connection with any delay originating from the foregoing causes.

Unless otherwise ordered, ships engaged upon mail service, under the conditions specified in the next paragraph, happening to be at anchor or stopped in lake Timsah, or at the North Light or South Light berths at the same time with other ships, whether ships of war or merchant ships, are authorised to pass such other ships and to continue their journey first, in their respective order of arrival in the lakes.

Mail steamers, viz., steamers performing a regular mail service under contract with a government, at fixed dates

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* For pilotage dues into and out of Port Said harbour, *see* Art 13. Until further orders, the pilotage dues *for the passage through the Canal* are not charged.

appointed in advance, and having been duly vouched for as such, must carry at the foremast head, by day, a blue signal with the letter P cut out in blank in the centre; and by night, a *white* light.

Art. 7.—All ships ready to enter the Canal must have their yards braced forward, their jib-booms run in and their boats swinging inboard. In addition to their two bow anchors, they must carry at the stern, a strong kedge, ready to let go on the pilot's recommendation.

Art. 8.—Sec. 1. Every ship must, during her passage through the Canal, have either in tow or ready to lower, a boat fully equipped carrying a hawser in readiness to be run out at once and made fast to one of the mooring posts on either side of the canal.

Sec. 2. All ships whether made fast in a siding, or moored at any point, or aground in the Canal, must ease their hawsers in order to give free passage to tugs, steam launches, hopper-barges, and any other craft of a light draught, that may have to pass them. The captain must set a watch both by day and night; the men to be in readiness to ease away or cut hawsers as may be required.

Sec. 3. All steamers, tugs included, must blow their whistles when approaching the curves of the Canal, also when approaching in either direction boats or lighters, dredgers, or any craft afloat. They must stop when the channel is not clear, and pass at a reduced speed all sidings, stone or earth-work yards; they must also slacken speed and have their two bow anchors ready for letting go when passing vessels made fast or under way, hopper-barges, dredgers, or any other craft.

Sec. 4. Whenever a collision appears probable, no ship must hesitate to run aground and thus avoid the collision. The expenses consequent upon grounding under these circumstances shall be defrayed by the ship in fault.

Sec. 5. Ships proceeding in the same direction are not allowed to pass each other under way in the Canal. In the case of a ship being allowed to pass another one ahead of her, she must conform with the Company's directions to that effect.

Sec. 6. Navigation of sailing craft of every description at night is entirely forbidden.

Sec. 7. Steamers intending to go through the Canal by night must first satisfy the agents of the Company in Port Said, or Port Thewfik, that they are provided :—

(1.) With an electric search-light or search-lights showing the channel 1,200 metres (1,312 yards) ahead, and so constructed as to admit of rapid splitting up of the beam of rays into two separate segments with a dark sector in the middle.

General chart 757.

(2) With electric lights powerful enough to light up a circular area of about 200 metres (219 yards) diameter, around the ship.

The agents of the Company decide whether the apparatus fulfils the requirements of the regulations, so that ships provided with them may, without inconvenience, be authorised to navigate the Canal by night.

Night transit may, however, be suspended in case of failure or want of power in the lights.*

Sec. 8. While navigating by night, ships must carry their usual lights, and have a man on the look-out forward.

Whenever a vessel navigating by night has made fast, whether in a siding or in the Canal, she must at once extinguish her search-light or search-lights, and thereupon extinguish her lights above stated, as well as her course lights.

All ships navigating by night in the Great Bitter lake between the North and South lights must extinguish their search-light or search-lights.

Any ship coming into Port Said by night from the South must extinguish her search-light or search-lights when making the curve from the Canal into the harbour.

Sec. 9. Whenever a ship navigating by night is accidentally stopped on her way, her white light astern must at once be replaced by a red light. In case other vessels are following her she must, at the same time, sound her steam-whistle four or five times in quick succession, repeating this at a few moments' interval until the ship following her repeats this signal, which must be taken as an order to slacken speed at once with a view to stopping, if need be.

Sec. 10. Whenever a ship makes fast, enters a siding, or gets aground, the captain must give immediate notice thereof by hoisting a signal at the masthead, viz: by day, a pendant; by night, a red light.

Sec. 11. Navigation by night by steamers unprovided with electric light is only authorised under exceptional circumstances, the captain accepting entire responsibility in writing for any delay, mishap, and damages that may happen to his own ship, as well as for any similar accidents he may cause to other ships in transit, or to the Company's craft and plant happening to be in the Canal. Ships navigating under these conditions remain subject to all other rules regarding night transit.

Art. 9. In the event of grounding, the agents of the Company alone shall have the right to direct all operations by

* Electric light apparatus can be hired at either end of the Canal, *see* page 63.

which a vessel is to be floated off again, to unload and tow the vessel as may be necessary, by means of the plant and stock which the Company has at hand, at the expense of the vessel, unless it be regularly proved that there was an insufficient depth of water in the Canal, or that erroneous direction by the pilot had caused the grounding.

The aforesaid costs of floating, towing, discharging, and re-loading, &c., must be paid conformably with a statement or estimate drawn up by the Company, before the departure of the ship from Port Said or Port Thewfik.*

All manœuvres with the object of helping grounded vessels to get off are formally prohibited to other ships in transit.

Art. 10.—The following prohibitions are hereby notified to captains.

1. The overloading of the deck, before entering the Canal, with coals or other merchandise which might alter the general stability of the vessels or would interfere with navigation ;—

2. The anchoring of a ship in the Canal, except through unavoidable circumstances, and then only with the consent of the pilots ;—

3. Throwing overboard in the ports, and during the journey from sea to sea, and at any point whatever of such journey, earth, ashes, cinders or material of any kind ;—

4. Picking up, without the direct intervention of the Company's agents, anything that may have fallen into the Canal ; if any object whatsoever falls overboard, the circumstance must immediately be made known to the pilot, who is instructed to transmit such information to the Company's agent at the nearest station. The recovery of all articles dropped

* Until further orders, whenever a ship going through the Canal happens, except in the roads and ports, to ground or stop in consequence of an accident independent of collision, the Company, in order to remove the obstruction in the fairway with all possible speed, and to hasten the restarting of the grounded or stopped ship, does not claim from the captains, the consignees, or the shipowners, any reimbursement whatever of expenses incurred in refloating the ship or towing her if necessary, as far as the next siding. If from such siding the ship continues her journey in tow, she must pay towage charges according to rates annexed to the present regulations.

It is moreover well understood that ships bear all expenses incurred in necessary repairs or putting into condition with a view to remedy such damages as might interfere with their restarting, whatever be the time at which these damages may have occurred, and that the said ships remain responsible for the damages which may be the consequence of their grounding.

The Company continue to perform the work of refloating the grounded ships under the supervision of their officers exclusively, and will use the first means available on board, and afterwards or simultaneously the plant or appliances belonging to the Company.

General chart 757.

into the Canal, in whatever way such salvage is effected is always carried out at the expense of the captain, to whom such articles are restored against reimbursement of the said expense ;—

5. Allowing any guns to be fired on board their ships ;—

6. Sounding the steam-whistle of ships in the ports of the Canal, except as an alarm signal in case of serious danger ;—

7. Burial in the banks of the Canal.

Art. 11.—Sec. 1. The net tonnage resulting from the system of measurement laid down by the International Commission of Constantinople, and inscribed on the special certificates issued by the competent authorities, or on the ship's official papers, is the basis for levying the special navigation due, which is at present (1908) seven francs seventy-five centimes (7 frs. 75 centimes).

In levying the dues, any alteration of net tonnage subsequent to the delivery of the above-mentioned certificate or papers is taken into account.

Sec. 2. The Canal authorities may ascertain whether cargo or passengers are carried in any spaces which, as shown by the certificate of tonnage, have not been included in the gross measurement, or which were allowed as deductions for the accommodation of the crew after measurement, or which being within the engine, boiler, or bunker space, form no part of the net tonnage shown on the certificate.

And generally may verify whether all the spaces which ought to be included in the tonnage are entered on the certificate and are exactly determined thereon.

Sec. 3. Every vessel not provided with a special certificate or official papers giving the net tonnage laid down by the Constantinople Commission, is measured by the Company's agents in conformity with the Constantinople rules, and must pay her dues on such measurement, until she produces a special certificate from the authorities of her own country.

Sec. 4. Until further orders, ships in ballast are allowed a reduction of 2 francs 50 centimes per ton on the tariff for transit.

Sec. 5. Any ship carrying mails or passengers, or having in her holds coals or other merchandise in whatever quantity, is not considered as being in ballast.

Sec. 6. The charge of ten francs per passenger above twelve years of age, or of five francs per passenger from 3 to 12 years old, as well as the transit dues, must be prepaid on entering the Canal at Port Said or Port Thewfik.

Sec. 7. The berthing or anchorage dues at Port Said, Ismailia, and opposite the Company's embankment at Port

Thewfik at the berth assigned to the ship by the Harbour-master, are fixed at two centimes per day per ton whatever be the duration of her stay, but the first 24 hours are not included. These dues will be collected every ten days.

Sec. 8. Claims for errors in the declaration of tonnage or in the levying of the dues must be sent in within a month after the ship's passage through the Canal. After this delay claims are not admitted; no erroneous application of the tariff can ever be brought forward as a precedent against the Company.

Art. 12.—Sec. 1. In the case of ships either towed or convoyed by the Company's tugs, no other division than that of one half of the length of the Canal is allowed; from Ismailia to Port Said being considered one half on one side, and from Ismailia to Port Thewfik the other half on the other side.

The charges for towage in the Canal by the Company's tug service are fixed as follows:—

For sailing vessels measuring 400 tons and under, 1,200 francs; for sailing vessels measuring above 400 tons, 1,200 francs for the first 400 tons, and 2½ francs for every surplus ton;

For steamers measuring above 400 tons, 2 francs per ton, without any distinction, upon their whole tonnage, but on the condition that they use their propelling power or keep it in readiness for assisting the tug;

Steamers measuring at most 400 tons, as well as steamers not wishing to give the assistance of their propelling power, will pay the same as sailing vessels;

For the towing of monitors, loaded or empty lighters, vessels not requiring the services of a first class tug, and all floating craft of any exceptional description, contracts are made by private agreements;

When a tug convoys or tows a vessel one half the length of the Canal only 600 francs are charged for the return of a first class, and 400 francs for the return of a second class tug, and one half only of the full dues is charged for the actual towing or convoying. All ships towed must furnish their own warps.

Sec. 2. The charges for towage in the roads by the Company's tug service to ships applying for tugs, are fixed at 25 centimes per ton of net tonnage; at Port Said, for the distance between the inner docks and the end of the jetties and conversely; at Port Thewfik, for the distance between the docks and the roads and conversely, the minimum charge is 50 francs.

For towage to a greater distance, the charge is fixed by private agreement.

General chart 757.

Sec. 3. When a ship requires a tug to act as a tender, the charge for convoying is 1,200 francs a day, if a tug of the first class be employed, and 800 francs a day for a tug of the second class. In the event of stoppage, the tug renders assistance in getting the vessel under way as often as may be necessary. If the vessel is towed by the tender any distance exceeding that from one station to another, the charge for towage may be demanded in lieu of the charge for doing duty as a tender.

Sec. 4. In all other cases, tug hire is invoiced according to tariff rates annexed to the present regulations.

Sec. 5. Shipowners are authorised to have their vessels towed or convoyed by their own tugs or tugs on hire, all responsibility connected with such acts devolving upon themselves.

Such tugs must be approved of by the Canal Company.

Ships towed or convoyed by approved tugs pay 50 centimes per ton as towage dues.

Such approved tugs, whenever they tow or convoy vessels belonging to their own proper owners, are free of any tax whatever.

Whenever they go through the Canal for the purpose of meeting vessels of their owners which they are about to tow or convoy, or when returning to their usual berth after having towed or convoyed the said vessels, tugs are not liable to the special navigation dues, but they must take a pilot on board.

All carrying of goods or psssengers is prohibited to them; the fact of having on board passengers or goods entails upon them the payment of all dues and charges to which ships in transit are subject.

Whenever approved tugs are used for towing or convoying vessels not belonging to their own proper owners, the same dues and charges are levied on them for every passage through the Canal as on ships in transit.

Over and above the special treatment specified by the present article, tugs belonging to private owners are subject to the strict observance of the present regulations concerning vessels under way, or berthed.

Art. 13.—Pilotage charges for entering Port Said harbour and leaving the same are fixed as follows for ships not going through the Canal:—

Pilotage by day - -	steamers - -	25 francs.
	sailing ships -	10 ,,
Pilotage by night; before sunrise and after sunset	steamers - -	50 ,,
	sailing ships -	20 ,,

General chart 757.

The payment of the pilotage charge for entering Port Said harbour and leaving the same is compulsory on every ship measuring more than 100 tons gross.

Whatever length of time ships may stay in the harbour of Port Said, and whatever commercial operations they may transact there, total remission will be made of the pilotage charges for day-time entrance, or remission of half the charge for night-time entrance, if they decide to go through the Canal.

The pilotage charge for entering or leaving Port Said harbour by night is fixed as follows for ships going through the Canal.

Steamers - - - -	25 francs.
Sailing ships - - -	10 ,,

Twenty francs per day are charged for a pilot kept on board in case of berthing

Art. 14.—Provisionally and until further orders, ships, barges, lighters, and other craft, either coming in ballast or empty from Port Said under orders for Ismailia, or returning from Ismailia to Port Said with cargoes of native produce; or bringing from Port Said to Ismailia cargoes bound to districts of Lower Egypt next to the Canal, and returning empty or in ballast from Ismailia to Port Said, are exempted either outward or homeward bound, whether they be empty or in ballast, from the special navigation dues and are only subject to the payment of 2 francs 60 centimes per ton, for their passage when loaded outward or homeward bound.

This toll must be prepaid when the said ships, barges, lighters or other craft enter the Canal, in ballast or empty, to go and load cargo of native produce at Ismailia, as well as when loaded.

As regards dues or charges other than the special navigation dues, the said ships, barges, lighters or other craft, must pay them in full.

Art. 15 —Charges of every description prescribed in these regulations must be paid in cash. Payments may be tendered either at the Company's cashier's offices in Egypt, or at the head office in Paris, or in the hands of any of the agents of the Company appointed to that effect.

In the case of any amounts tendered otherwise than at the Company's cashier's offices in the isthmus, *receipts* are delivered to shipowners or consignees which the captain may hand as cash to the Company's agents in Egypt appointed to collect the dues.

In case of payments not being effected in time to admit of *receipts* being sent to captains, the Company will inform by

telegraph their agents in Egypt of the amounts so paid. The cost of telegrams to be defrayed by the shipowners.

Whenever amounts thus paid in advance are insufficient for the discharge in full of all charges and incidental expenses due by ships, the balance must be paid in Egypt at the Company's cashier's offices.

SIGNALS.—In 1906, a new set of Canal signals was compiled, and as all vessels passing through the Canal must carry a pilot, who is acquainted with the signals, the Canal Company have not thought it necessary to publish the new Code; in future, only the signals between ships and the Port authorities will be published.

By day, the signals by Station masters (*i.e.*, at gares, semaphore stations, &c.) are made by black balls and cones; by night, by means of red and white lights. The general tenor of the signals is as to the starting, stopping and speed of ships.

Tidal signals.—Are shown at gares, &c. between the Little Bitter lake and Port Thewfik; they are as follows:—

By Day:—

1. One ball at peak - -	Current is running South.
2. When no signal is shown -	,, ,, nil.
3. Two balls at peak - -	,, ,, North.

By Night:—

4. White light at peak -	Current is running South.
5. ,, over red light at peak - - -	,, ,, nil.
6. Red light at peak - -	,, ,, North.

Signals between ships under way:—

By Day:—

7. Any pendant at masthead -	I am aground.
8. ,, ,, half-mast -	I am moored. You can move on.
9. Any flag at masthead -	Slacken your speed.

Special Lights to be shown from Vessels at night.—

1. At night, a red light is to be shown at masthead if the vessel is slightly aground, and two red lights if, on the contrary, the ship is sufficiently hard aground to require tug assistance.

2. Vessels moored in the sidings are to exhibit four white lights, on the side where the channel is clear viz.: One light at the stem; one light on the bulwarks, one-third the distance from the stem to the stern; one light on the bulwarks two-thirds the distance from the stem to the stern; and, one light at the stern.

General chart 757.

3. All vessels made fast at night in the Canal owing to any damage preventing their continuing under way, or finding themselves under necessity to anchor in the Great Bitter lake outside of the South or North Light berths, must hoist a white light above two vertical red lights.

Petroleum vessels.—Any vessel laden with petroleum oil in bulk arriving before any port of access to the Canal must make herself known by showing at the mizenmast one of the following distinguishing signals :—

By day - -	A red flag above one ball.
By night - -	A white light beneath two red lights.

When such vessels make any stay in port they will be isolated by means of floating booms. Before entering the Canal, the captain must sign and hand to the officials a declaration, or in some cases two declarations, as to the capacity of his oil tanks, the flashing point of the oil or of its products of which his cargo consists, and other particulars required.

Should a vessel carry petroleum or any of its products with a flash point below 73°·4 Fahrenheit, she must be in tow of one of the Company's tugs during the whole period of transit through the Canal, and navigation by night is prohibited.

Medical inspection.—No vessel is allowed to enter the Canal from the southward without permission of the sanitary authorities at Suez, to obtain which it may be necessary to anchor.

Transit of Canal in Quarantine.—Vessels passing through the Canal in quarantine must hoist two yellow flags, vertical, at the fore, by day; and two red lights, vertical, at the fore, by night. This signal must be shown throughout the transit and until well clear of the port of exit. An Egyptian sanitary guard is placed on board.

When coaling in quarantine, the coal bunkers, with the passages to and from them to the coal lighters, must be screened off to the satisfaction of the chief of the sanitary guard before coaling is allowed to proceed.

DIRECTIONS.—The Suez canal has (1909), a depth of 31 feet throughout its whole length, and the draught of water of any ship using it is limited at present to 28 feet. The following directions are little more than a summary of the Regulations with a few remarks and comments gained by practical experience in the transit. Every ship on arrival at

either end of the Canal must be entered at the Transit Office, and otherwise comply with the Canal Company's regulations, which permit steam vessels to pass through the Canal either under their own steam or to be towed, but towing is compulsory with sailing vessels above 50 tons.

All vessels are required to have head and stern anchors ready, also hawsers for warping; and all vessels measuring over 100 tons are bound to take a pilot, who communicates all particulars concerning the passage through, but does not relieve the captain of the responsibility of safe steering.

The deepest water throughout is in the centre of the Canal; in passing through, it is therefore more a question of careful steerage to keep the ship exactly in the centre than of pilotage, and as it is probable that the commander is better acquainted with the behaviour of his own vessel than the pilot who is a stranger, the commander is held responsible for the management of his ship. The closest attention is required in order to steer with a small helm.

The iron beacons on the several lakes are placed 136 feet on either side of the centre of the deep water in the channel. Over the greater part of the narrow reaches of the Canal, the channel is marked by floating beacons, placed abreast of the mooring bollards, at every cable's length. All beacons and buoys, as before described, are *black* tipped with *white* on the eastern side, and *red* on the western side of the deep water channel.

When two vessels proceeding in an opposite direction are in sight of each other, they must both decrease their speed and hug starboard shore, or stop if so required by the pilot. Attention must also be paid to the signals to "Gare" which may be made from the various stations along the banks.

At every 5 or 6 miles a gare or short widening of the Canal gives room for a vessel to haul in and allow the passage of another vessel with ease. Small vessels can pass each other at any part by stopping and using warps, but they cannot do so under steam, except at great risk of running on shore and thus delaying the whole traffic of the Canal.

Ships proceeding in the same direction may pass each other in the Great Bitter lake without asking permission, and may, if the Canal is free from obstruction, re-enter the Canal in the order in which they arrive; but should they have to stop from any cause before re-entering, they must proceed in the order in which they entered the Bitter lake from the Canal.

In the pilotage of a steam-vessel, the principal point requiring attention is the speed, and it must be born in mind that the maximum speed allowed is $5\frac{1}{3}$ knots. If a vessel that

General chart 757.

under ordinary circumstances steers well is found to steer wildly on entering the Canal, it is probable the right speed has not been discovered; and more than probable, on account of the natural desire to get rapidly through, that she is going too fast; the engines in this case should be eased until she steers better.

In passing from a wider into a narrower part of the Canal, the same speed cannot be preserved at the same time with good steerage, and it becomes necessary to ease the engines.

As regards speed, it may be stated in short that each vessel has her "Canal temper," meaning thereby a speed suitable to the size of the vessel, at which she steers her best. It may not be out of place also to remark that, when in the Canal, there is a certain speed attainable by each vessel which she *will not* exceed, no matter how much the speed of the engines may be increased. This is owing to the large displacement of water as compared with the width and depth of the Canal, and, it need scarcely be added, do s not affect a vessel so much in the lakes.

In passing round a curve in the Canal, in very long vessels, the greatest caution must be exercised, and there should be a tug towing ahead. The engines should be stopped or moved as slowly as possible, that she may pass it at the slowest speed. This operation requires the utmost attention, especially in a vessel fitted with twin propellers, as regards the proximity of the propellers to the banks.

In passing the Canal dredgers hauled into the banks and also vessels in the sidings, great caution is required. The speed should be very slow, as the reaction of the ship's wave, even if she is going at a moderate rate, is liable to make the stationary vessels snap their fastenings, and then fall foul of the ship under way.

All vessels should be steered from the bridge, the captain and the pilot, if possible, being alongside the helmsmen. The latter should be selected men.

The only serious damage vessels are liable to sustain in passing through the Canal is from the propeller coming in contact with the bank; when the wind blows across the Canal, care must be taken to prevent the ship drifting to leeward, and all possible upper gear should be sent down. It is better to stop and secure to the bollards than to risk damaging the propeller by using it near the lee bank. In stopping the engines, when fitted with a two-bladed propeller, a necessary precaution suggests itself, viz., to place the screw upright, not only on account of possible obstructions, but also from the well-known fact that a ship steers better with it in that position.

General chart 757.

With a beam wind, great care is required in getting under way from a Gare to prevent drifting on lee bank. Hawsers fitted with spliced eyes are the most convenient for Canal work.

The most difficult part of the Canal passage, leaving the effect of a strong wind out of consideration, is between Suez and the Little Bitter lake, on account of the rapid tides prevailing in that space; and this portion should if possible be navigated either during the slack or against an opposing tide. Ships have frequently grounded in this locality, probably from disregard of this precaution.

Anchorage.—Between Port Said and Port Thewfik, vessels can anchor only in lake Timsah, and in the Great Bitter lake. No vessel is allowed to anchor in the Canal except from unavoidable circumstances, and then only with the consent of the pilot.

When a vessel is obliged to stop, a siding should if possible be reached. When one is not at hand, the vessel must be made fast head and stern to the weather bank. In either case, in accordance with the Regulations, *see* page 79, by night a vessel should show four white lights on the side where the channel is clear, viz.:—One light at the stem; one light on the bulwarks, one-third the distance from the stem to the stern; one light on the bulwarks, two-thirds the distance from the stem to the stern; and one light at the stern. The usual look-out must be kept.

Plan of Suez bay. Var. 3° W.

SUEZ BAY (*Lat. 29° 54′ N., Long. 32° 32′ E.*), is at the northern end of the gulf of Suez; and, for present purposes, we shall consider Ras el Adabieh its southern boundary on the western side, and Ras Mesalle on the eastern side. The distance between these two points is nearly 6 miles in a south-easterly direction, and the length of the bay, from the town of Suez to Ras el Adabieh, $6\frac{1}{3}$ miles in a south-south-westerly direction.

The shores of the bay are skirted by reefs and shoal water, and are low and sandy, except on the western and south-western sides where the Atakah mountains touch the coast. On the northern side is the desert; and, on the eastern side, the low coast rises very gradually to hills of moderate height in the interior. The general depths in Suez bay are from 9 and 10 fathoms in the middle to a few feet near the shore.

Caution.—Vessels should not approach the shores of Suez bay without a chart or a good pilot, on account of the numerous coral patches, especially in the vicinity of Ayun Musa (the wells of Moses), conspicuously marked by palm trees, and near which

General charts 757, 8a, and 2523.

Plan 3214, Port Thewfik, and 734 Suez bay. Var. 3° W.

is a quarantine station; also off Ras Mesalle, the low point southward of Ayun Musa; and in the bight on the western shore under the stone quarries in the slope of Atakah.

Town.—At the head of the gulf stands the town of Suez, which became an important place when the route to India through Egypt was established; the opening of the Canal, however, considerably reduced its importance. Suez has, however, always been the seat of a considerable transit trade, the ancient cities Arsinoe and Kolzum having stood in the neighbourhood.

The town stands on a spit of the desert projecting eastward, with the bay of Suez on its southern side and Suez creek on its northern side. There is a large government house with a conspicuous dome, and many well built stone houses. A clerk or consular agent is in charge of the British consulate at Suez, and a similar agent at Port Thewfik renders assistance when necessary to ships entering the Canal; both these officers are under the direct control of the Consul General at Port Said. Nearly every nation is represented by a consul or consular agent, and nearly every vessel entering the Canal is boarded by an agent in a steam launch.

There are two hospitals, one French, the other belonging to the Egyptian government; the latter, erected in 1899, is a conspicuous, square stone building with outbuildings near it.

An English church was erected at Suez in 1898, near the railway station. There are Roman Catholic churches both at Suez and at Port Thewfik.

The Khedive's kiosk (*Lat. 29° 58′ N., Long 32° 32′ E.*), stands on higher ground at the back of the town and is conspicuous from the sea; as is also the large house, formerly the Suez hotel, which is the easternmost building in the place, but which is no longer used as an hotel.

Trade.—In the year 1906 the number of mercantile steamers entering the port of Suez was 266, with an aggregate of 225,326 net tonnage; of these steamers no less than 245 with a net tonnage of 203,022 tons were British. The principal exports are sugar, cereals, cigarettes, hides, &c. The imports are textiles, sugar, cereals, chemicals, dyes, and various products of Arabia, India, and China. The value of the exports was 315,490*l.*E., and of the imports, 896,932*l.*E.

The carrying trade of the Red sea from Suez is almost entirely in the hands of the Khedivial Mail Company.

Population.—At the time of the census of 1897, the population of the town of Suez was given at 18,274; it is said to be slightly increasing. Besides this number were 6,696

General charts 757 8a, and 2523.

Plans 3214, Port Thewfik, and 734 Suez bay. Var. 3° W.

Bedouins living in the environs, thus forming a total of 24,970, classified as follows:—Egyptians, 22,196; Greeks, 1,000; British, 641; Italians, 506; French, 270; Austrians, 265; Russians, 51; Germans, 10; others, 31. In addition, numerous pilgrims and travellers continually pass through on their way to Mecca; in the year 1898 the pilgrim traffic amounted to 16,895, and by 1906 it had increased to 30,334.

Communications.—The mail service between Suez, Port Sudan and Suakin is weekly; the day of departure from Suez being Wednesdays.

Between 6h. a.m. and 9h. p.m. there is a half-hourly train service between Suez and Port Thewfik. There is also a train service twice a day to Cairo and Alexandria.

Telegraph.—From Suez telegrams can be sent by Egyptian telegraph to the interior, and by the Eastern Telegraph Company to England *via* Malta; also to Port Sudan, Suakin, Jidda, Massawa, Asab, Perim, Obokh, Aden, Bombay, &c., by submarine cable through the Red sea, Gulf of Aden, &c.; *see* telegraph cables, page 7. There is wireless telegraph station at Port Thewfik.

Quarantine.—The quarantine station, as already stated, is near Ayun Musa. Formerly no vessel was allowed to enter the Canal from the southward without a medical inspection by the sanitary authorities at Suez, for which purpose it was necessary that vessels should anchor. Now, however, vessels are permitted to pass through the Canal, if so desired, in quarantine, and nearly all mail and passenger steam vessels as well as many cargo steamers now do so, *see* page 80.

PORT THEWFIK (Port Ibrahim).—Basins and Docks *(Lat. 29° 56′ N., Long. 23° 32′ E.).*—The wet docks or North and South basins which form the port of Suez are named Port Ibrahim but are now included in Port Thewfik; *see* page 66. The depth of water in the North basin varies from 24 to 29 feet, and the Khedivial Mail Steamship Co.'s steam-vessels lie alongside the north-west wall of this basin. The depth in the South basin is from 20 to 24 feet except at the end of the basin nearest the dry dock, about 117 yards from which the depths decrease gradually to as little as 17 or 18 feet, soft mud over rock, immediately in front of the dock entrance. The oil steamers of the Shell Company lie alongside opposite the oil tanks in the North basin, and small local steamers lie alongside in the South basin. Other vessels anchor or make fast to the mooring buoys and haul their sterns in to the bollards on the wall.

General charts 757, 8a, and 2523.

Plans 3214, Ports Ibrahim and Thewfik, and 734 Suez bay. Var. 3° W.

The line of railway to Cairo, Port Said, and Alexandria is carried along the central mole, which divides the two basins, but from the ruinous state of the walls it is not safe for vessels to moor alongside. Permission to enter either of the basins must be obtained from the Captain of the Port at the Port Office.

Harbour lights.—The following lights mark the entrance to the basins; they are unwatched:—

1. A *fixed red* light near the extreme of the North mole-head.
2. A *fixed green* light near the extreme of the South mole-head.
3. A *fixed white* light at the inner (or central) mole-head. This light does not show until it bears eastward of N.E. ½ N.

Buoys.—Two large can buoys with rails round the top, painted black, are moored about 4½ cables seaward of the entrance of the port; on the northern side of the fairway, at about 2½ cables from the mole-head, there is an additional buoy painted black and white. These buoys are not kept well coated with paint and consequently their colours as a rule cannot be recognised.

Entering the basins a vessel should be steered for the *white* light on the central mole-head, showing midway between the *red* and *green* lights, bearing N.E. by E. ¾ E., which leads between the outer pair of buoys and into the basins.

The Dry Dock, now the Ismail dock, is at the head of the South basin, and is owned by the Khedivial Mail Steamship and Graving Dock Company, Limited. It is 406 feet long over all, by 72½ feet wide at a level of 25¾ feet below high water springs, and can dock a ship 400 feet in length, drawing 23 feet water. A length of 406 feet on blocks can be obtained if necessary. There is a depth of 29¾ feet water over the sill, and from 23 to 26¾ feet on the blocks, at high water, springs. In winter, one foot more water may sometimes be obtained. The depth in the channel leading to the dock does not exceed 24 feet at high water, springs.

In connection with the dock is a floating steam crane capable of lifting 25 tons, and a workshop where ordinary repairs can be made good by the Dock Company, but, for heavy repairs, the assistance of the Canal Company might be necessary, though the appliances for repairs have been much improved of late years.

The number of vessels using this dock in the year 1906 was 30, of which 20 were British. The charge for docking is 70*l.* (English) for the first day and 35*l.* for each succeeding day.

General charts 757, 8a, and 2523.

Plans, 3214, Ports Ibrahim and Thewfik, and 734 Suez bay. Var. 3° W.

Coal and Supplies.—There are imported annually about 22,000 tons of Welsh coal, and in stock generally from 6,000 to 7,000 tons, the price averaging about 31*s.* to 37*s.* per ton. Vessels coal 20 to 30 feet from the wharf, where the walls are safe, in from 21 to 25 feet at low water, springs; or from lighters in the roads, where the weather rarely impedes coaling except when a gale or strong southerly wind sets in. Provisions are plentiful and good; and, in the proper seasons, various fruits as well as fine vegetables may be procured, there being large and productive gardens in the immediate neighbourhood of the town.

Water of excellent quality may be obtained through Messrs. G. Perry & Co., of Suez; it being brought out in tanks towed by steam launches to vessels in the roads. The source of supply is the Freshwater canal from the Nile through Ismailia to Suez, and during its course it must be subject to much contamination; but at Suez the water is passed through filter beds and thence by pipes to the reservoir, which latter, however, being of a capacity of about 5,000 tons only, it is probable that a sudden large demand could scarcely be met.

Suez Canal Southern entrance. General remarks. (*Lat. 29° 56′ N., Long. 32° 33′ E.*).—Between the south-eastern side of Port Ibrahim and Kad-el-Marakeb point is the entrance to the Suez maritime canal, at Port Thewfik, as fully described in the preceding chapter. The offices of the Company, with the signal and pilot station, are conveniently situated near the inner end of the gare on the north-western bank. Directions for its navigation, with the official regulations, having been already given, it is only necessary here to repeat that, of vessels arriving in Suez bay from the southward, all those over 100 tons, gross, desirous of navigating the Canal must take a pilot, and that no vessel is permitted to enter without the sanction of the sanitary authorities at Suez, which may make it necessary to anchor, especially if it is desired to proceed through the Canal in pratique; but, as before explained, the greater part of vessels now prefer to make the transit in quarantine.

Suez creek.—On the western side of the Suez canal, about one mile within the entrance, and just above the entrance of the Canal Company's southern basin, is the entrance to Suez creek, a tidal channel leading up to the town of Suez, the town being on the western side of the creek. At low water, springs, this channel commands only 4 feet water, with a breadth of 100 yards, and has extensive dry sandbanks on either side.

General charts 757, 8a, and 2523.

Plans 3214, Ports Ibrahim and Thewfik, and 734 Suez bay. Var. 3° W.

Harbour light.—To assist small craft in navigating this creek at night, a small *fixed white* light is shown, at about 20 feet above the sea, from an open iron lighthouse erected on the southern end of the Middle sand in 3½ feet at low water; it is visible about 5 miles in clear weather, and bears N.W. one cable from the jetty head near the old quarantine station, and about N.E. 1½ cables from the triangular black beacon, 15 feet high, marking the western side of the channel at the Middle bend.

Boats going up the creek should leave the light on the starboard hand, and the beacon on the port hand.

SUEZ BAY and ROADSTEAD.—Canal approach.—**Kad-el-Marakeh**, forming the south-eastern boundary of Suez roadstead, and on the eastern side of the approach to Suez bay, is a low sandy point covered at high water. At low water about three quarters of a mile of sand uncovers in a westerly and south-westerly direction.

A patch of rocks, dry at low water, lies S.W. 8 cables from Kad-el-Marakeh. A beacon stands 5 cables south of the western extremes of this patch.

Light buoys.—About 3 cables south-westward from the extremes of the spit and 9½ cables E. ½ S. from Kal-ah-Kebireh pole beacon, lies a red light-buoy in 4¾ fathoms, which shows two *green lights* vertically, visible at least 2 miles.

About 8 cables N.N.E. ¼ E. from the Spit buoy and 2 cables westward from the north-western part of the spit, in 4 fathoms water, is a red light-buoy showing a *fixed green* light, and about 1¼ cables north-westward of this buoy, in about 30 feet, is another light-buoy, painted red, and showing a *fixed red* light. The approach to the Canal entrance is between these two buoys.

Extending from Kad-el-Marakeh is the Canal breakwater, about 5 cables long in a W.N.W. and E.S.E. direction.

Kal-ah-Kebireh shoal (*Lat 29° 54′ N., Long. 32° 31′ E.*), in the middle of Suez roadstead, is of coral, uncovers about 2 feet at low water, and is about 4½ cables long north-north-west and south-south-east by about 3 cables wide; near its northern and southern ends are blocks of stone visible at low water. Many of the outlying rocks of the reef are marked by iron poles which are about 2 feet above water at high tide. Near the centre formerly stood a lighthouse; it has been demolished, and replaced by a pole beacon 20 feet high surrounded by a cage.

General charts 757, 8a, and 2523.

Plans 3214, Ports Ibrahim and Thewfik, and 734 Suez bay. Var. 3° W.

There are several shallow patches of from 2 to 2½ fathoms in the vicinity of Kal-ah-Kebireh. Ships of deep draught will find a good channel westward of the shoal.

Lights.—In addition to the central pole beacon, three iron frame-work light beacons, named respectively the North, South, and West beacons, now mark this shoal, each carrying two gas lights placed vertically; *see* view on Plan 734. The particulars of the lights are as follows:—

North beacon stands on the northern 1¼-fathoms patch N. 14° E. about 5$\frac{6}{10}$ cables from the pole beacon; it shows two *fixed lights* vertically, 15 feet apart, *red* over *white*, the upper light being 57 feet above high water.

South beacon, 2$\frac{6}{10}$ cables S. 17° E. from the pole beacon, shows two *fixed red* lights, vertical, 15 feet apart, the upper light being 44 feet above high water.

West beacon, on a detached western portion of the reef, bears N. 59° W. 4$\frac{2}{10}$ cables from the pole beacon, and shows two *fixed white* lights, vertical, 12 feet apart, the upper light 42 feet above high water.

Etuleh shoals.—Buoy.—A red light-buoy, marked "Etuleh" in black letters, and showing a *fixed white* light, is moored in 7 fathoms about 5½ cables south-eastward from the Etuleh shoals, and W.N.W. 9½ cables from Kal-ah-Kabireh West beacon.

Leading beacons, 1¾ cables apart, stand at the head of Suez bay. The rear beacon is shaped like a capital **T**, the extremes of the arms painted red whilst the inner part is cut away. The Front beacon is simply a staff without top-mark. These beacons in line N. 3° W. lead through the deepest part of the channel westward of Newport rock and about 1½ cables westward of the red spit buoy with *green* light.

The anchorage in the northern part of Suez bay is well sheltered from all but southerly winds, which frequently blow home accompanied by a heavy sea. Vessels should not bring the entrance to Port Ibrahim eastward of E.N.E. when anchoring, as the holding-ground then becomes bad. A good berth is in about 5 fathoms, with Kal-ah-Kebireh South beacon bearing S.W. by S. and the outer extreme of the Canal breakwater E. ½ S. The bottom here is stiff clay and excellent holding-ground.

Anchorage may also be obtained off Port Ibrahim, in about 3½ fathoms, but clear of the traffic.

General charts 757, 8a, and 2523.

Plan 734, Suez bay. Var. 3° W.

Tides.—It is high water, full and change, in Suez bay at 11h. 59m.; springs rise 7 feet, neaps 4 feet. After a continuance of southerly winds for two or three days, the water will sometimes rise 8 or 9 feet.

Newport rock (*Lat. 29° 53′ N., Long. 32° 33′ E.*).—This so-called rock is in fact a very small knoll of soft mud in which no sign of rock was found until a boring of 13 feet had been made through the mud. It has a least depth of 13 feet at low water, and lies S.E. by S. about $1\frac{3}{4}$ miles from Kal-ah-Kebireh South beacon.

Light.—From a cylindrical lighthouse rising from the centre of the keeper's dwelling, on a screw-pile iron structure on the centre of Newport rock, is exhibited at 43 feet above high water, *a revolving red* light with a period of *thirty seconds*, visible 12 miles. The lantern and roof of the dwelling are painted pink, the dwelling itself white, the piles black. *See* view on Plan 734.

Fog signal.—During thick or foggy weather, a bell is struck at this lighthouse *once* every *thirty seconds.*

Lloyds Signals.—Newport rock is also a Lloyds signal station with which ships can communicate by International code.

Shoal.—In 1899 a small 4-fathoms patch surrounded by depths of from 10 to 12 fathoms was discovered on the eastern side of the fairway, at the entrance to Suez bay, from which Newport rock lighthouse bears N. 16° W. $1\frac{6}{10}$ miles, and the solitary palm tree at Ayun Musa N. 88° E.

There are also shoal patches with depths of $1\frac{1}{4}$ to 4 fathoms lying about 1 mile to the south-eastward of the Newport rock.

Directions.—Having cleared the Canal entrance, or weighed from Suez bay, a vessel should pass between the Kal-ah-Kebireh shoal, marked by the beacons described, and the Spit light-buoy off Kad-el-Marakeb, about $1\frac{1}{2}$ cables from the latter, with the leading beacons at the head of the bay in line N. 3° W. in a depth of 28 feet of water, which is being dredged deeper; then, steering S. $\frac{1}{4}$ E., the Newport rock lighthouse should be passed about $1\frac{1}{2}$ cables distant on the port hand. The same course for another mile leads in not less than 36 feet past Ras el Adabieh, care being taken not to open the beacons so as to cross the $4\frac{1}{4}$ fathom patch, charted S.W. $\frac{1}{4}$ W., 7 cables, from Newport rock; from thence, a S. $\frac{3}{4}$ W. course if continued for 17 miles clears the low and dangerous points, Mesalle and Sudr, on the eastern side of the gulf, when a fairway course S. by E. $\frac{3}{4}$ E. may be steered.

General charts 757, 8a, and 2523.

Plan 734, Suez bay. Var. 3° W.

Should dredging be in progress between Kal-ah-Kebireh shoal and the Spit buoy, vessels, whether from the southward or northward, should pass westward of the Kal-ah-Kebireh shoal in order to avoid inconveniencing the dredgers, recovering the leading line immediately afterwards.* The new mode of beaconing and lighting that shoal greatly facilitates this.

Approaching from the southward, the eastern slope of Jebel Atakah bearing N. by W. ½ W., leads clear of the shoal water on the eastern side of the gulf. When Newport rock light is seen it may be steered for on a N. ¾ E. bearing, and be passed on its western side 1½ cables distant with the beacons at the head of Suez bay in line N. 3° W.; from thence, a N. ¼ W. course leads between Kal-ah-Kebireh and the Spit light-buoy off Kad-el-Marakeb.

To ensure clearing the reefs off Ras Mesalle on a misty night, the safest course is to skirt round the western shore, southward of Ras-el-Adabieh keeping in from 15 to 18 fathoms. This will lead up until the Newport rock light is sighted, when it should be brought to bear N. ¾ E. as before.

Western shore.—Jebel Atakah is a remarkable range of mountains on the western side of Suez bay, rising to a height of 1,800 feet, nearly abreast of Ras el Adabieh, where they slope to the eastward and form a good landmark.

Ras el Adabieh, a low sandy spit about 6 cables long in a north-easterly direction, is on the south-western side of Suez bay, about 3 miles eastward of the highest part of the Atakah mountains, and is marked near its extreme by a low stone hut. Shoal water extends from it about half a mile towards the Newport rock. Eastward of this, the water deepens gradually to 3¾ and 4 fathoms, and, 2 miles distant from the point is the narrow channel of 6 to 7 fathoms, one to two cables wide, between the bank and the Newport rock, the fairway to the canal.

Adabieh bay.—On the north-western side of the Ras is Adabieh bay, forming, when clear of the shoal water extending from the point, a fine, clear, and almost land-locked harbour, admirably suited for a quarantine station, with anchorage in from 4½ to 7 and 8 fathoms. The Atakah reef lies in the centre of the entrance, and the Mensiya reef at the edge of Adabieh point reef. The shore of the bay is steep-to for boats to land, and communication with Port Thewfik or the Canal is easy under canvas, the prevailing wind during the greater part of the year being a leading wind both ways.

*** On March 21st, 1908, notice was given that during the dredging operations then going on in Suez bay, and until futher notice, the Western channel only should be used by all vessels.**

General charts 757, 8a, and 2523.

Plan 734, Suez bay.

Immediately southward of the hut on Ras el Adabieh, and for 6 miles along shore to the south-westward, the navigable water extends to within 5 cables of the beach.

Eastern shore.—Ras Mesalle (*Lat. 29° 49′ N., Long. 32° 36′ E.*), the south-eastern extreme of Suez bay, is low, sandy, and skirted by a flat which extends in a west-north-westerly direction about 8 cables. Shoal patches lie off this point, distant $1\frac{1}{3}$ miles and $2\frac{1}{4}$ miles nearly. The Conry rock, the outer patch 4 fathoms, lies W. by S. $\frac{3}{4}$ S. from the point; the inner patch of $3\frac{3}{4}$ fathoms is nearly on the same line. In passing, do not shoal to less than 20 fathoms.

Anchorage.—At $1\frac{3}{4}$ miles southward of Ras Mesalle is Kad-el-Towila, a coral reef extending $1\frac{1}{2}$ miles from the shore and covered at low water, with deep water close to its western extreme; vessels may anchor between the reef and Ras Mesalle in about 4 fathoms. sand, with the Ras bearing N. by W. 5 or 6 cables or in deeper water farther west.

CHAPTER III.

GULF OF SUEZ AND STRAIT OF JUBAL.

(Lat. 30° N., Long. 32¼° E., to Lat. 27¼° N., Long. 34¼° E.)

VARIATION IN 1909.—Decreasing 4′ annually.

Chart 757, Gulf of Suez. Var. 3° W.

GULF OF SUEZ.—General Remarks.—From the town of Suez to the southern point of Shadwán island, the Gulf of Suez is 172 miles long in a south-south-east direction; and, southward of Suez bay, it varies in width from 10 to 25 miles. The narrowest part of the navigable water southward of Ras Mesalle is in the Strait of Jubal, between Shab Ali on the eastern, and the Ashrafi shoals and Shab Jubal on the western side; here it is only 6½ miles wide. At Ras Metarma and at the Sheratíb shoals it is about 7½ miles wide. The shores are bordered by high land, in many places approaching close to the sea, and often affording conspicuous landmarks; and on either side they are fringed throughout their whole length by coral reefs, which, on the eastern side more particularly, extend a considerable distance to seaward. On the western side, the coast reef does not generally reach so far seaward as on the eastern side, and the shore may therefore be approached with more confidence. In the Strait of Jubal, and in the gulf generally, there are outlying patches to be avoided, all of which are fully described in the present chapter.

Winds.—In the Gulf of Suez, northerly winds prevail nearly all the year round; the wind is generally lightest near the western shore, especially in the neighbourhood of high land. With a strong north-westerly wind in the gulf, it is usually calm in the bay southward of Jebel Atakah. At Suez, the northerly wind usually freshens up late in the afternoon and continues until midnight. By getting under way in the evening, a sailing-vessel will reach the continuous winds to the southward without experiencing a calm. *See* Table, page 554.

Anchorages.—There are many convenient anchorages in the Gulf of Suez, useful for sailing vessels or for steam-vessels of small power obliged to anchor through stress of weather; but, as they are all in close proximity to reefs, care is required

Chart 757, Gulf of Suez. Var. 3° W.

in approaching them, adopting the precaution, so often mentioned, of sailing or steaming with the sun astern of the vessel, and keeping a look-out from the masthead. The best anchorages, are described at their proper places in this chapter. When anchoring with a north-westerly wind, it is advisable not to hug the shore too closely in case of a shift of wind, which is often sudden and unexpected.

Tidal streams.—Notwithstanding the difference between the times of high water, full and change, at Suez and Ashrafi, the tidal stream runs northward throughout the whole length of the Gulf of Suez when the tide is rising at Suez, and southward when falling; both streams set fairly in mid-channel, at a maximum rate of 1½ knots at springs, and half a knot at neaps, except near Ras Abu-deraj, Sheratíb shoals, Ashrafi islands, &c., where the direction is uncertain. In the Strait of Jubal, the strength of the stream is increased to from 1½ to 2 knots, and here it runs northward longer than southward; nearer the reefs the direction is uncertain. Northward of Tor, high water occurs almost simultaneously with Suez; and, in the southern part of the gulf, it is low water when it is high water at Suez, and *vice versâ; see* also page 21.

GULF of SUEZ.—WEST SHORE.—From Ras el Adabieh the coast has a general south-westerly trend for about 19 miles, and then trends south-eastward for about 15 miles, thus forming a deep bay, nearly in the centre of which, at about 2 miles from the shore, are the Strickland shoals and Harris rock, two rocky patches about 4 miles apart, which should be avoided.

Beacon.—There is a beacon on the inner or western Strickland shoal; and a coastguard station on the mainland opposite to it.

Soundings.—A glance at the chart shows that the 20-fathoms line of soundings is a safe though close guide for a sailing vessel working to windward at night between Ras Abu-deraj and Ras Mesalle, as, with the exception of the coast at the foot of the Abu-deraj mountains where the navigable water extends to within a cable of the shore, that depth will be carried until within 5 cables of any danger. The eastern extreme of the Atakah mountains bearing N. by E. ½ E. leads clear of the shoal patches on the western side of the gulf.

The western shore is the best to work to windward upon. When within 6 or 7 miles of Ras el Adabieh, a vessel may stand

Chart 757, Gulf of Suez. Var. 3° W.

close over to the shore, as the navigable water extends to within 5 cables of the beach.

Ras Abu-deraj (*Lat. 29° 22′ N., Long. 32° 34′ E.*).—From the entrance of Suez bay, the mountains of Abu-deraj, 4,250 feet high, on the western side of the gulf, are visible, the northern part of the range being fronted by the Atakah range. The eastern spur of the Abu-deraj mountains slopes eastward and forms Ras Abu-deraj.

Abu-deraj reef.—From Ras Abu-deraj, the coast reef continues for many miles fringing the shore. Nearly 3 miles southward of the Ras, it extends as a rocky spit about 8 cables seaward, and is at that part called Abu-deraj reef. Zafarana light, which is just within range, bearing South leads 1½ miles outside any danger.

From Ras Abu-deraj, the coast trends southward to Zafarana point, and is fringed by a coral reef extending from 5 to 8 cables, except in the vicinity of the latter point, where, as Zafarana reef, it extends 1¾ miles in a south-easterly direction from the lighthouse. In the space between Ras Abu-deraj and Zafarana point, the ground rises gradually to higher land in the interior, and is of a sandy appearance.

ZAFARANA POINT.—LIGHT (*Lat. 29° 6′ N., Long. 32° 40′ E.*).—This point is 47 miles southward from Newport rock lighthouse, and is low and flat. About 4¼ miles west-north-west from it is a conspicuous black peak 270 feet high. Near the extreme point stands the lighthouse, a white circular stone tower 82 feet high, from which is exhibited, at 83 feet above high water, a *fixed white* light, visible 14 miles. At the base of the lighthouse stands the keeper's dwelling, a low white rectangular flat-roofed building. *See* view on chart.

Anchorage.—Zafarana reef, the projecting part of the coast reef before mentioned, extends from the lighthouse 1¾ miles in a south-easterly direction; whilst southward of the lighthouse, the land trends a little westward of South, forming a bay where anchorage may be found in several parts, but the most convenient is under the lee of the point reef, in about 5 fathoms, sand and coral, with the lighthouse bearing N.N.W. ½ W., distant 1¾ miles.

EASTERN SHORE.—On this side of the gulf, the coast reef extends farther seaward than on the western side, and the outlying patches are more numerous. *See* Caution, page 43.

Ras Sudr and **Ras Metarma,** on the eastern side of the Gulf, 14 and 23 miles respectively from Ras Mesalle,

Chart 757, Gulf of Suez. Var. 3° W.

are each low, sandy, and skirted by a reef, which extends from 5 cables to a mile from the shore. The eastern slope of the Atakah mountains bearing N. by W. ½ W. leads about 2 miles clear of the shoal water off these points, but, as this is a distant mark, great care is required in obtaining a correct bearing. Indifferent anchorage may be obtained southward of both these points.

In 1902, when passing near Ras Metarma, much discoloured water was observed from H.M.S. *Scout*, giving an impression that the Ras must be extending, but no means were taken for ascertaining this.

Kad Mallap (*Lat. 29° 12′ N., Long. 32° 52′ E.*).—Ras Mallap, 18 miles south-eastward from Ras Metarma, is a low sandy point, between which and Ras Legyah, 3¾ miles to the north-westward extends Kad Mallap, a coral shoal reaching 1½ miles to seaward from the nearest part of the coast. Between Kad Mallap and Zafarana reef the navigable channel is 11 miles wide.

Anchorage.—On the southern side of Ras Mallap, between it and Jebel Hammam Firaun, temporary anchorage with protection from north-westerly winds may be found in from 11 to 12 fathoms, with Ras Mallap bearing N.W. ½ N. 3 cables, and Hammam bluff E.S.E. 1¾ miles; but vessels should be prepared to weigh immediately in the event of a shift of wind.

Aspect. — Mountains. — On the eastern side of the Gulf of Suez, in a break in the apparently flat table-topped Jebel et Tih range, which extends far into the interior of the Sinai peninsula, is Jebel Bishr or Barn hill, a white cliffy mountain 2,050 feet high, standing conspicuously by itself 20 miles south-eastward from Ras Mesalle. Jebel Hammam Firaun (*Lat. 29° 11′ N., Long. 33° 59′ E.*), is a range 29 miles southward of Jebel Bishr, whose north-western bluff, when seen from the northward, is very conspicuous and shows as a precipitous cliff 1,620 feet high, very near the beach, and is one of the best marks on the eastern shore of the gulf; *see* views on chart. The eastern side slopes gradually inshore. There is a hot salt spring and two hot caverns near the foot of the cliff. Farther southward on the Hammam range is Jebel Useit, 1,670 feet high, and the highest peak of the range.

From Jebel Bishr to within a few miles immediately northward of Jebel Hammam Firaun, the hills on the eastern side of the gulf recede from the low coast, and having no prominent

Chart 757, Gulf of Suez. Var. 3° W.

features, are useless for landmarks The lower range of white gravel-coloured Legyah hills skirting the shore just northward of Hammam Firaun are remarkable.

WEST SHORE.—From Zafarana point to Ras Gharib the coast is composed of undulating desert plains rising gradually to the bases of the mountains, which, with the exception of Jebel Thlemel, (*Lat. 29° 0′ N., Long. 32′ 33′ E.*), are from 15 to 20 miles inland. Ras Gharib lighthouse is 51½ miles S.S.E. from Zafarana lighthouse, the coast in the intermediate space being without any prominent points, though slightly indented, but not in any part receding more than 5½ miles from an imaginary line connecting the two lighthouses.

Aspect.—Mountains.—South-westward of Zafarana lighthouse, and 16 miles distant, the high table-lands of Abu Regim and Jebel Zafarana rise to a height of 4,750 feet. The north-eastern end of their summit is conspicuously marked by a nipple-shaped hill rising out of the range at a slightly less altitude. Jebel Thlemal, 8 miles south-westward from Zafarana lighthouse, and 3 miles inland, is 2,175 feet high, and has four knobs on it, and is one of the most useful landmarks in this part of the gulf.

Jebel Ruahmi (*Lat. 28° 30′ N., Long 32° 34′ E.*), is 16 miles inland, and is a rugged-topped hill with a sharp conical peak at its southern end, 3,575 in height, which forms a good and conspicuous mark.

Jebel Gharib (*Lat. 28° 6′ N., Long. 32° 51′ E.*), also 16 miles inland, is 5,740 feet high, and is a solitary and precipitous peak of beautiful form. This mountain can almost always be seen at night, and is a most useful mark for ships running up and down the gulf.

Depths.—Between Zafarana point and Ras Gharib the 20-fathoms line does not approach the western shore in any part within a mile, except about 7 or 8 miles northward of Ras Gharib, where it is about 8 cables off-shore. A reef fringes the shore the whole distance between Zafarana point and Ras Gharib, but does not extend seaward more than 5 cables at any part, except in the vicinity of Zafarana lighthouse, as already mentioned. In the fairway, from 32 to 37 fathoms will be found, but a vessel certain of her distance from the western shore may approach to within 1½ miles of it.

Anchorages.—Mersa Thlemel.—This anchorage is the best in the Gulf of Suez, though it should be entered with caution by ships of over 20 feet draught, as the shore shoals

General charts 8a, and 2523.

Chart 757, Gulf of Suez. Var. 3° W.

rapidly when once inside the reef. Lieutenant Hopkinson, of the Egyptian coastguard service, reports (1908) that buoys had been placed on the extreme of the Zafarana reef, and also on the reef at the south side of the entrance, but as these are liable to shift he had erected two beacons as a leading mark between the reefs at the entrance. The rear beacon is about 35 feet high, and is surmounted by a triangle vertex up and is situated about 250 yards in rear of the coastguard barracks. The front beacon is about 15 feet high and is surmounted by a triangle base upwards and is situated about 50 yards in front of the barracks. These beacons in line N. 50 W. lead into the harbour, but when once inside the reef, vessels should turn to north and anchor when the barracks are abeam in about 5 fathoms.

If the beacons are not visible there is a conspicuous peak on the north end of the hills behind the barracks which when in line with the centre of the barracks will lead in on the same course.

Ras Abu Baka.—Ras Abu Baka (*Lat. 28° 32′ N., Long. 32° 56′ E.*), 15 miles north-westward of Ras Gharib, forms the eastern extreme of a bay in which good anchorage may be found in from 6 to 8 fathoms, with protection from southerly winds; from the anchorage, Jebel Jehan, on the eastern shore, bears E. by S. ⅛ S., 21 miles distant.

RAS GHARIB.—LIGHT (*Lat. 28° 21′ N., Long. 33°6′ E.*) —Ras Gharib is a prominent point on the western shore at the foot of a low white-faced range of gravel hills. About 100 yards distant from the beach stands the lighthouse, an iron cylinder 180 feet high, on a masonry base, with three supporting stays, the whole painted red, and exhibiting, at 165 feet above high water a *fixed white* light, visible 20 miles. At the base of the lighthouse is the keeper's dwelling, a circular building painted white, and close by, a store; *see* view on chart.

A reef extends 5 cables south-eastward from the lighthouse, and an iron pile jetty, 180 feet long, extends from the shore near the lighthouse; there are 4½ feet water at its head at high water, springs, the rise then being about 18 inches; boats can nearly always go alongside. Ras Gharib has communication by camel with Suez once a fortnight; the journey occupies four days.

Anchorage.—There is tolerably well-sheltered anchorage in 4 or 5 fathoms southward of the reef, but the flood tide is strong and vessels do not usually swing to a northerly wind. The French gunboat *Météore* anchored here in 1898, in 7 fathoms,

Chart 757, Gulf of Suez. Var. 3° W.

sand and coral, the lighthouse bearing N. 25° W. about 5 cables; an examination of the anchorage disclosed no dangers, the depth decreasing gradually towards the shore. A heavy swell sets round the point at times.

EASTERN SHORE.—Aspect.—Mountains.—On the eastern shore, southward of Jebel Hammam Firaun and Jebel Useit, the broken-up white coast hills gradually decrease in height until, at 16 miles south-eastward of the latter, close to a valley, they end westward of an outlying spur of the dark granite range of Jebel Sumra. About 11 miles further southward, the light-coloured hills again rise, and, gradually increasing in height and becoming more and more covered with sand, join the Jehan granite coast range, of which Jebel Jehan, 1,420 feet high, is the northernmost peak.

At Ras Sheratíb (*Lat. 28° 40′ N., Long. 33° 12′ E.*), the break in the light-coloured hills, showing prominently against the dark range at the back, forms a good mark for ascertaining a ship's position.

From the neighbourhood of Zafarana, on the west coast, the lofty and massive mountain, Jebel Serbal, 6,680 feet high, and the more distant sugar-loaf, peak, Umm Shomer, (*Lat. 28° 21′ N., Long. 33° 55′ E.*), 8,530 feet high, one of the Sinai range, and nearly 80 miles south-eastward from Zafarana, are seen rising high above the east coast hills. When a little farther southward, the dark Jehan and Huswah range, on the eastern coast, have the appearance of an island.

Depths.—Southward of Kad Mallap shoal and as far as Ras Sheratíb, the coast is fringed by a reef extending seaward from 2 to 8 cables in some places. With the exception of a small part near Jebel Useit, the 20-fathoms line does not approach the coast reef within 1¼ miles.

Anchorage.—Ras Abu Zenima (*Lat. 29° 2′ N., Long. 33° 6′ E.*), 11 miles south-eastward of Jebel Hammam Firaun, is a low gravel point, having shoal water extending 8 cables from it in a southerly direction. The gulf is 23 miles wide at this part. The small bay, commencing about a mile eastward of Ras Abu Zenima, is one of the best sheltered anchorages on the eastern side of the gulf A sheikh's tomb is erected on the southern side of the point. The camel track from Mount Sinai and Tor to Suez passes close to the shore in this vicinity; which has accordingly been made a quarantine inspection station for pilgrims returning from Hedjaz to Suez; it is connected by telegraph with Tor.

There is no other anchorage on this shore between that just described and Tor harbour, 57 miles farther south-eastward, except a very indifferent one 4 miles northward of that port.

General charts 8a, and 2523.

Chart 757, Gulf of Suez. Var. 3° W.

Ras Sheratíb (*Lat. 28° 40′ N., Long. 33° 12′ E.*), is a low sandy point on the eastern side of the gulf. In the locality the hills are 2 or 3 miles inland.

SHERATIB SHOALS are a narrow ridge of rocky ground with from 3½ to 4½ fathoms water, about 3¼ miles long east-south-east and west-north-west; their western extreme bears S.W. ½ W. 6½ miles from Ras Sheratíb, and S.S.E ¾ E. 39 miles from Zafarana lighthouse; they narrow the navigable channel down the gulf at this part to 7½ miles. A strong tide race runs over the ridge even in calm weather.

Clearing marks.—The Ass's Ears or Jebel Abu Durba, a remarkable double boulder rock on the Jehan range, 2½ miles southward of the peak, on with the summit of Jebel Húswah, the highest hill on the coast range, 3½ miles south-eastward of the former, bearing S.E. by E. ½ E., leads southward of the shoal; *see* view B on chart. Ras Gharib light bearing South also leads 1½ miles westward of it. Do not stand into less than 30 fathoms in the neighbourhood of this shoal.

Shab el Hassah, a reef which dries in parts at low water, is 2¼ miles long north and south, its northern extreme bearing S. by W. ¾ W. 2¾ miles from Ras Sheratíb. The outer edge of Shab el Hassah is 2¼ miles from the shore, with which it is united by a bank with from one to 3 fathoms.

WESTERN SHORE.—Aspect.—From Ras Gharib to the southward, the reef-fringed coast continues low in a general south-easterly direction for 27 miles, to the Zeiti hills. The coast should not be approached within 1½ miles nor the water shoaled to less than 20 fathoms. To the southward, this depth is less than a mile from the shore, so it is necessary to be careful in approaching it.

Chart 2838, Strait of Jubal.

Ras Shukhair.—(*Lat. 28° 8′ N., Long. 33° 17′ E.*).—**Anchorage.**—Ras Shukhair, 15½ miles S.S.E. ½ E. from Ras Gharib lighthouse, attains a height of 270 feet in low gravel cliffs; it forms the south-eastern extreme of a small bay receding about one mile, in which there is sheltered anchorage in 4 fathoms, sand and coral, with Ras Gharib lighthouse bearing N.N.W. ½ W. and just touching the northern point of the bay. In the northern part of the bay, 3 fathoms will be found at 5 cables from the shore; in the southern part, that depth is only 2 cables from the shore.

Zeiti hills when first seen [illegible] from the northward or southward, make as islets; they approach the shore closely, the highest point of the range, 1,530 feet high, being only a mile inland and sloping towards the sea.

General charts 8a and 2523.

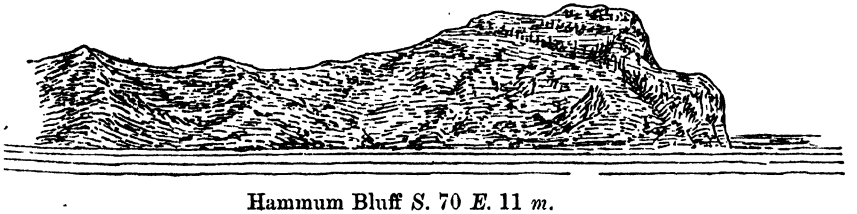
Chart 2838, Strait of Jubal. Var. 3° W.

Ras Zeiti (*Lat. 27° 56′ N., Long. 33° 31′ E.*), projects but slightly from the general line of coast, and the southern end of the Zeiti hills forms a peninsula, westward of which is Ghubbet Ti Zeiti, a large and almost inaccessible sheet of water, 5 miles long north-west and south-east by 3 miles wide, with general depths of from 5 to 7 fathoms. There are no dangers off the coast in the vicinity of the Zeiti hills, the deep water extending within a cable of the shore; they should be kept aboard at night by vessels bound southward until Ashrafi light is sighted. Westward of the hills, the country is flat rising gently to the foot of the back range.

At 6½ miles south-eastward of Ras Zeiti and 1⅓ miles north-westward of Umm-el-Kyaman islet, close the shore, are some old petroleum wells, occasionally worked, and some old huts.

Umm-el-Kyaman islet (*Lat. 27° 50′ N., Long. 33° 35′ E.*). —**Anchorage.**—Abreast of the southern end of the Zeiti hills, a coral reef with the low sandy islet Umm-el-Kyaman, projects nearly 5 cables from the land. From 3 to 5 cables southward of Umm-el-Kyaman is sheltered and convenient anchorage in from 5 to 7 fathoms, sand, the best on the western side of the gulf except that southward of Zafarana lighthouse; there are near the shore in this little bay several stone buildings in ruinous condition but visible from some distance; also a cairn on a hill on the western side of the bay, useful marks in locating the anchorage. Inside the island reef is a boat harbour, perfectly protected.

EASTERN SHORE.—**Aspect.**—In *lat. 28° 31′ N.*, the granite hills of the Jehan coast range, covered in some parts with sand, commence and skirt the shore for 24 miles in a south-easterly direction, terminating in the wedge-shaped hill Jebel Hammam Syedni Musa (Hammum Bluff, *see* sketch) 840 feet high, 3 miles northward of Tor. That place, as presently described, is easily distinguished by its grove of palm trees, which, with the exception of a few close to the beach 1½ miles northward of Tor, are the only trees to be seen in the Gulf of Suez; they are visible 10 miles.



Hammum Bluff *S.* 70 *E.* 11 *m.*

General charts 757, 8a, and 2523.

Chart 2838, Strait of Jubal. Var. 3° W.

Southward of Tor there are no coast hills; the land consisting of a wide plain, rising gently from the shore to a height of 800 or 1,000 feet at the base of the mountain, here some 15 or 18 miles inland. This plain also extends a considerable distance northward, on the eastern side of the Húswah range, between Jebel Gabeliya and the mountains of the interior.

The most conspicuous marks for compass bearings are the hills northward of Tor; also Jebel Gerain Utud, a prominent dark sugar-loaf peak westward of the main range, and bearing E. by S. ¾ S. 41 miles from the anchorage in Tor harbour; and, Jebel Towila, 1,560 feet high, a detached rugged-topped sand-covered hill, 16½ miles farther south-eastward.

Between Shab el Hassah and Tor, the coast has no outlying dangers, with the exception of two small reefs abreast of Jebel, Húswah, but should not be approached nearer than about 3 cables. The only anchorage along the shore is an indifferent one about 4½ miles northward of Tor, abreast of a few low palm trees close to the beach, near a spring of brackish water.

Chart 757, Gulf of Suez.

Jebel Abu Durba, or Ass's Ears, is a remarkable hill on the Jehan range, close to the shore and 1,266 feet high. An idea of its shape may be inferred from its name. The range is the most northern of the granite coast hills.

Mount Sinai (*Lat. 28° 32′ N., Long. 33° 59′ E.*).—The summit of this mountain is 7,450 feet above the level of the sea. No part of the Gulf of Suez, except a very small portion near the bluff of Jebel Hammam Firaun, can be seen from Mount Sinai; Tor and all the coast of Egypt being hidden by Jebel Katherina, 1,180 feet higher than Sinai and lying 2 miles westward of it.

Depths.—The 20-fathoms line, abreast of the Jehan hills, is within 5 cables of the shore at some places, but farther southward it is at a greater distance. The various contour-lines of equal depths being clearly marked on the chart, it is unnecessary to give their inflexions, as they are more readily understood by reference to the chart than by a written description.

Chart 2838, Straits of Jubal.

Tor bank, nearly in the centre of the gulf, here about 16 miles wide, is an extensive bank of soundings, having general depths of from 10 to 20 fathoms, sand and shells, with coral shoals of from 3 to 9 fathoms, the only part with as little as 3 fathoms being the Moresby shoal, next described; and there is a patch of 4 fathoms N.N.W. ½ W. 2¼ miles from the Moresby shoal.

General charts 757 and 2523.

Chart 2838, Straits of Jubal. Var. 3° W.

Moresby Shoal (*Lat. 28° 10′ N., Long. 33° 27′ E.*), E. ¾ N., 9½ miles from Ras Shukhair, and on which there are only 3 fathoms, is the shoalest part at the southern end of Tor bank. From this shoal, Ras Gharib lighthouse bears N.W. ⅞ W. 21½ miles, and Ashrafi lighthouse S.S.E. ⅜ E. 26½ miles, being one mile outside the limit of visibility of the former, and 8½ miles outside that of the latter. In proceeding southward, however, Ras Gharib light can generally be seen from aloft until after the shoal is passed; to ensure clearing it, the light should not be brought westward of N.W. ½ W. The highest part of the Zeiti hills bearing S. by E. leads a mile westward of the Moresby shoal. When Jebel Gharib bears W. ¼ S. a ship is abreast of the shoal.

Felix Jones patches are 9 miles south-eastward of the Moresby shoal and lies east-north-east from 5 to 7 miles distant from the northern part of the Zeiti hills; they are of coral, with depths of 8 and 9 fathoms. Although the bottom is seen very distinctly, even from the deck, when passing these coral shoals, they may be crossed over with confidence as they have been closely examined.

Plan of Tor harbour on chart 8a, and chart 2838, Straits of Jubal.

TOR HARBOUR (*Lat. 28° 14′ N., Long. 33° 37′ E.*).—**Beacons, &c.** — Tor harbour affords good anchorage; it consists of a small bay, from the western side of which a coral spit extends 5 or 6 cables to the southward, marked at its south-eastern extreme by the Grafton beacon, an open iron-work structure surmounted by a spherical cage, the whole being about 12 feet high. The harbour is protected from the south-westward by the Erg Riyah reef, which has a passage on either side of it.

Depths.—The best water in entering the harbour by either channel is not less than 7 fathoms; as the Grafton beacon is rounded, there is 6 fathoms, in which depth is the anchorage, with the ruined fort, bearing N.E., and with the Grafton beacon 1½ or 2 cables distant.

Erg Riyah reef.—Beacon.—This reef is about a mile long in a north-north-west direction, by 3 cables wide, and has on it from 4 feet to 3 fathoms water; even with strong north-westerly winds the sea rarely breaks on it, and it must therefore be approached with caution. Near its centre stands the Bey beacon, an open iron-work structure on piles, surmounted by a triangular cage, the whole being 37 feet high. Between this shoal and the coral spit, marked by the Grafton beacon,

Plan of Tor Harbour on chart 8a, and chart 2838, Straits of Jubal. Var. 3° W.

the navigable channel is 4 cables wide with 7 fathoms of water, whilst that between it and the eastern shore is 6 cables wide with 11 fathoms of water.

Jebel Hammam Syedni Musa, the first bluff northward of Tor, bearing North leads 7 cables westward of Erg Riyah reef.

A coral shoal of small extent with 3¼ fathoms water, close eastward of the fairway of the southern channel, lies with the western part of the ruined fort bearing N. by E. and the Grafton beacon N.W. by W. ½ W. 3½ cables.

The shore reefs extend westward 3 cables from the old ruined fort, and the whole of the head of the harbour has only from one to 3 fathoms water.

Southward and westward of Tor, are several coral patches with from 6 to 10 fathoms water.

The harbour is not sufficiently roomy for very large vessels, nor for the number of smaller vessels by which it is sometimes filled during the pilgrim season. The old town stands at the northern end of the harbour, and has some well-built stone houses, a large Greek church, and a garden with good water. Southward of the old town is the fort before mentioned in ruins.

Jetties.—Extending from the eastern side of the harbour are five jetties; of these, the northernmost stretches off from the ruined fort into 2 fathoms water. About 2 cables southward of this, are three large jetties, each about 1,000 feet long, with three conspicuous quarantine buildings at their inner ends. The outer end of the northernmost is in 2 fathoms; and, of the other two, in 5 or 6 fathoms. The fifth and southernmost jetty is small and is built out into 3 fathoms water about abreast of the Bey beacon on Erg Riyah reef. New buildings have been erected half a mile or more inland, for the accommodation of pilgrims in quarantine.

Communication is maintained with Suez by overland telegraph wire, and with the monastery at mount Sinai by means of camels. The journey to the latter place occupies two days and a half over a very bad road.

About 1½ miles north-westward from Tor, at the foot of some low hills, is a square building or tower at the foot of a large date grove belonging to the convent of mount Sinai; this date grove is watered by a large and clear spring of brackish water, close behind the garden walls near the hills; it has a temperature of about 95° and makes an excellent warm bath.

Quarantine.—During the pilgrim season—from February to May—a sanitary commission from Alexandria resides here. When visited by H.M.S. *Fantome* in April 1907, there were

Plan of Tor Harbour on chart 8a, also chart 2838, Straits of Jubal.

several English doctors and nine or ten hospital nurses in attendance. It is reported that about 45,000 pilgrims passed through quarantine at Tor in this year. If a pilgrim vessel arrives at Suez and an epidemic shows itself during her five days' quarantine there, she is sent back to Tor to ride out a longer quarantine.

Supplies in any considerable quantity are not to be obtained at Tor; fresh bread may be purchased, but beef is very poor. Fresh water in small quantities may be had, but the water in the wells near the beach is brackish. Plenty of fruit is at times brought in from the country.

Directions.—With the prevailing north-westerly winds, the northern channel is the best for a sailing ship entering Tor harbour and the eastern channel the best for quitting it.

In entering by the northern channel, skirt the coral spit on the northern side, which shows green, keeping it closer aboard than Erg Riyah reef, as it is more easily seen. After rounding the spit, marked by the Grafton beacon, anchor in the berth described, *see* Depths, bearing in mind that the water shoals very quickly from 7 to 3 fathoms.

Entering by the eastern channel, the eye is the best guide, until the beacons can be made out. The shore reef is more easily seen than Erg Riyah, and therefore should be closed with until the Grafton beacon is seen, when it may be steered for bearing N. ½ W., and the harbour entered as before. In entering by this passage, when nearly abreast of the Bey beacon, keep well up for the Grafton beacon, in order to avoid the 3¼-fathoms and 3 fathom patches before described.

Chart 2838, Straits of Jubal. Var. 3° W.

SHEIKH RIYAH HARBOUR (*Lat. 28° 9′ N., Long. 33° 39′ E.*), 5 miles south-eastward of Tor, is another well-sheltered anchorage inside a low sandy point, from which a clearly defined reef extends in a southerly direction, and from its southern extreme is prolonged 6 cables south-eastward by a rocky shoal with from 1½ to 3 fathoms water.

The channel between the reef described and the shore reef eastward of it is about 3 cables wide with a least depth of 4 fathoms and clear of all danger. Anchorage may be found anywhere in the bay in from 5 to 7 fathoms, the anchorage ground being about 7 cables in diameter.

Shoal.—At 2½ miles south-westward of Sheikh Riyah harbour is a coral 4-fathoms patch, at the northern end of a shoal 2½ miles long with under 5 fathoms on it.

General charts 757 and 2523.

Chart 2838, Straits of Jubal. Var. 3° W.

Reefs on the Eastern shore. — Poynder shoal (*Lat. 27° 55′ N., Long. 33° 44′ E.*).—Between Tor harbour and the northern part of Shab Ali reef are several reefs with outlying patches, rendering navigation on this side of the gulf more than usually dangerous. Of these, the most outlying are Shab Jarrah, 2½ miles in length north-north-west and south-south-east and partly uncovered at low water; and Poynder shoal, a small rocky 3-fathoms patch 4½ miles north-westward of Shab Ali and upwards of 5 miles distant from the eastern shore of the gulf.

The STRAIT of JUBAL, between the coast of Egypt and the south-western shore of El Gáah or the Sinai peninsula, forms the junction between the Red sea and the Gulf of Suez. The strait lies north-west and south-east from the peninsula of Zeiti to the island of Shadwán on the Egyptian side, and from Ras Iknaisi to Ras Muhammed on the Arabian side.

The Arabian or eastern coast of the strait will be found described in detail at page 118; it consists of a wide sandy plain, reaching to the foot of the high mountain range about 14 miles inland. The shore is fringed with dangerous coral reefs extending in places 7 miles from it, as Shab Mahmoud Shab Ali, and others, giving little warning by the lead, but avoidable during daylight by keeping a good look-out, the change in the colour of the water from deep blue to bright green being very apparent.

WESTERN SHORE.—Aspect.—Inshore, westward of the Zeiti hills, the land is flat, rising gently to the foot of the back range of hills, which extend in a south-south-east direction, approach the coast 15 miles farther southward. From the southern point of the Zeiti peninsula, the coast is generally low and rises to a range of hills from 1,000 to 2,000 feet high at from 3 to 8 miles inland. In the background, the most conspicuous peaks are the Sugar-loaf mountain, 5,165 feet high, at the northern end of a range; Cap hill, 6,350 feet high; and, Slope hill, 7,165 feet high. *See* view on chart.

From abreast of Ras Zeiti, Ashrafi lighthouse may be seen above the horizon standing by itself, with the peak of Jubal island, 410 feet high, and the tops of the hills on Shadwán island, 990 feet high, a little southward of it. About two thirds of the distance between Ras Zeiti and Jebel Esh are the grey granite hills of Gimsah, the summit of which is 265 feet high, and in the neighbourhood of which are petroleum wells and some worked-out sulphur mines. With the exception of these cliffs, the shore and off-lying islands are low, fringed by coral reefs, and a recent examination of the locality by H.M.S.

General charts 757, 8a, and 2523.

Chart 2838, Straits of Jubal. Var. 3° W.

Fantome has revealed the existence of many shallow, coral heads in the inner channels hitherto unknown.

Jebel Esh (*Lat. 27° 30′ N., Long. 33° 33′ E.*), 1,370 feet high, is the highest part of the range of hills near the shore, 20 miles southward of Umm-el-Kyaman islet.

Southward of Jebel Esh the coast becomes flat, and 10 miles southward of that mountain, the coast range ends abruptly.

ASHRAFI ISLANDS and REEFS, commencing nearly 4 miles eastward of the southern point of the Zeiti peninsula, extend from thence about 7½ miles in a south-south-east direction; the islands are composed of dead coral and sand, from 6 to 15 feet high, and lie scattered over the two extensive reefs, Shab Ashrafi and Shab Kowarat.

There are good channels clear of dangers between the reefs; that between the outer reef and Shab Kowarat being known as the Ashrafi channel; and that westward of Shab Kowarat, as the Kowarat channel. Southward of Shab Ashrafi, the north-western reef of the group, and between it and the reef stretching to the northward from North Gaysúm island, are two sunken coral rocks, which, however, can easily be seen from the masthead.

By day, all dangers northward of Ashrafi are cleared by not opening the lighthouse clear of the eastern side of Shadwán, which island can be seen over the intervening land.

LIGHT (*Lat. 27° 47′ N., Long. 33° 42′ E.*).—On the easternmost of the three reefs of Ashrafi, near its northern end, stands the lighthouse, a structure of open ironwork, on a base of masonry, the whole being 140 feet high and painted red, from which is exhibited, at 125 feet above high water, a *revolving white* light, with a *one-minute* period, visible 17 miles. Communication with the lighthouse is by means of an iron jetty, alongside of which boats can go at all times of tide. *See* view on charts 2,838 and 8*a*.

Tides.—It is high water, full and change, at Ashrafi lighthouse at 6h. The rise is 1ft. 9ins., but is much affected by the wind. *See* remarks on tidal streams at pages 20 and 94.

Shoals.—Shoal water extends 5 cables both northward and eastward of Ashrafi lighthouse, and 2¼ miles southward of it. From the eastward, the water shoals very rapidly towards the lighthouse. The light bearing S.E. by S. leads a mile eastward of Shab Ashrafi, and, bearing N.W., leads one mile eastward of Jubal Sería and 1¼ miles eastward of Shab Abu Nahas. But, as frequently remarked, when within 2 miles of the reefs, the tidal streams are so uncertain in direction, that when the given

Chart 2838, Straits of Jubal. Var. 3° W.

bearings are approached, much caution is necessary. The peak of Jubal island S. by E. ½ E. leads 2 miles eastward of the Ashrafi reefs.

Shab Kowarat.—Umm-el-Kurush harbour.—In the southern end of this reef, about 6 miles in length, the central and largest of the Ashrafi reefs, is a singular oval basin, called by Arab pilots Umm-el-Kurush, having from 6 to 7 fathoms water, and a sandy bottom. The entrance to this harbour is through a break in the eastern side of the reef, one mile from the southern point of the Ashrafi islands; the passage has only 14 feet water, and is barely 2 cables wide. Vessels drawing 12 feet may cross the barrier at the entrance by keeping the islet off the northern point of North Gaysúm island on with a sharp distinct peak on the mainland, bearing W. by S. ½ S., until the water deepens to 6 fathoms; then haul sharply to the northward for Umm-el-Kurush islet, to avoid a shoal patch inside of and fronting the entrance.

Shab Kowarat terminates southward in Sandy islet, 5 feet above the level of the sea; there is anchorage in from 7 to 10 fathoms, sand and coral, about 2 cables south-eastward of that islet.

The Gaysúm islands are two islands connected and surrounded by a reef; they lie southward of Sandy islet forming a deep bay with from 36 to 20 fathoms, but the north-westerly swell renders it an unsafe anchorage.

South Gaysúm, the northern point of which is one mile from Sandy islet, is the largest, and is conspicuous from two hillocks at its northern end, 100 and 37 feet respectively above the sea; the highest is conical and of a dark brown colour; the other, white and sandy.

North Gaysúm is flat, having a hillock 50 feet high on its eastern side; an islet lies off its north extreme, from which the reef extends 2 miles north-north-westward. Between the north extreme of the reef and the sandbank on the southern end of Shab Ashrafi are the two sunken rocks already mentioned. On the eastern side of the reef extending from North Gaysúm are some detached rocks; the western side has no outlying dangers.

On the southern shore of South Gaysúm, is an Arab fishing village, and a few tents are occasionally found on the neighbouring islands.

Anchorage in 10 or 12 fathoms, may be found on the south-eastern side of South Gaysúm, with the two eastern points of the island in line N. ¼ E., and Jubal island peak E.S.E. South-eastward of this berth, the water deepens rapidly to 20 and 30 fathoms.

General charts 757, 8a, and 2523.

Chart 2838, Straits of Jubal. Var. 3° W.

The South point of Zeiti peninsula (*Lat. 27° 47′ N., Long. 33° 35′ E.*), 3 miles southward of Umm-el-Kyaman islet, is low and nearly joined to the coral island Ranim, from the south-eastern side of which the reef Shab Ranim extends in that direction 1½ miles.

Southward of the southern point of Zeiti, the mainland recedes, forming a large bay, with ranges of hills running parallel with the shore, and terminating westward in a very high and singularly rugged ridge, the heights of whose principal peaks have been already given at page 106; these mountains are about 20 miles inland, and visible nearly 100 miles in clear weather.

South-westward of the Gaysúm islands is a cluster of extensive reefs, extending southward about 13 miles from the south extreme of Zeiti peninsula without any navigable channel for large vessels; the chart must be consulted for the intricate passages between them.

JUBAL ISLAND, whose round peak is 410 feet above the sea, is about 3 miles south-eastward of Gaysúm, and is 2½ miles long by 1½ miles wide; it is generally visible at a moderate distance by night, and bearings of it are useful for fixing a ship's position. The eastern side is steep-to, having from 30 to 40 fathoms at a distance of one mile.

Shab Jubal, the coral reef extending northward from Jubal island, is more than 3 miles long, having on it one large and two small islets, with black coral rocks appearing above water round its edges. Off the northern end of the reef, a bank with from 8 to 10 fathoms extends nearly a mile farther in the same direction. The eastern side of the reef is steep-to. The largest islet on the reef, Jubal Sería, has a bluff point at its eastern end, and, with the north-eastern end of Jubal island, forms a small bay. There are no outlying dangers on the eastern side of Jubal or of Shab Jubal.

Anchorage (*Lat. 27° 37′ N., Long. 33° 49′ E.*).—There is good anchorage in about 8 fathoms on a bank of coral and sand 2 or 3 cables south-eastward of the southern point of Jubal island, with the peak bearing North. Care must be taken to avoid the rocks southward and westward of the anchorage. A strong tidal stream runs over the reefs between Jubal and Towila islands.

TOWILA ISLAND.—Southward and westward of Jubal island, and connected with it by a cluster of reefs and sand-banks, is the low flat coral island, Towila, 5¼ miles long north and south by 3¼ miles wide. The highest part of the island is

Chart 2838, Straits of Jubal. Var. 3° W.

on the eastern side, and is only from 30 to 50 feet above the sea. An extensive fringing coral reef surrounds Towila, except for about a mile on its eastern side.

Anchorage.—About 3 cables eastward of the southern point of Towila is a small sandy cay only about 3 feet above water. Good anchorage may be found, in about 6 fathoms, with this cay bearing N. by E. ½ E. from one to 2 miles distant.

Reefs.—A cluster of coral reefs, more or less detached, extends 6½ miles southward from the southern end of Towila island; of these, Shab Towila and Shab Abu Rakau cover only at high water.

Towila and Shadwán channels.—Westward of Jubal and Towila islands, and between them and Gaysúm, with the long extent of reefs southward of it, is the clear deep Towila channel, its south-western entrance being well marked by the small low sandy islet Vahari Towila.

Eastward of Towila and its long southern extension of shoals, is the Shadwán channel, its narrowest part being between Towila and the Seaul reefs, where it is nearly 1¾ miles wide with a depth of 35 to 45 fathoms. *See* Details and directions on pages 115 and 117.

Seaul islets and reefs.—Between Jubal and Shadwán islands, and between Towila and Shadwán, are five detached coral reefs, mostly covered at low water; they are Shab Umm Úsh, Shab Abu Nahas, Seaul Sería, Seaul Kebir, and Blind reef. Two of these reefs, Seaul Sería and Seaul Kebir, are marked by coral islets or rocks above water.

Seaul Kebir, the eastern and largest rock, as the name implies, is nearly half a mile in length and 15 feet high, and is surrounded by a clearly defined reef having deep water close to it on all sides.

At 1¼ miles to the westward, and with a clear and deep channel between, are three small rocks, the northernmost being 10 feet high, situated on the eastern side of Seaul Sería, a reef surrounding a lagoon 2¼ miles long north-west and south-east by 1¼ miles wide, and covered at high water.

Anchorage.—There is anchorage in about 8 fathoms on the southern side of Seaul Sería, but care must be taken to be clear of the many detached rocks at the edge of the reef as charted.

Blind reef, covered at low water, is in mid-channel between Seaul Kebir reef and the northern prong of Shadwán north-western reef, and about 7½ cables distant from each. It is about 3 cables long east and west, very narrow, not so easily seen as the others, and has deep water close round it.

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Chart 2838, Straits of Jubal. Var. 3° W.

Shab Umm Úsh or **Horse-shoe reef.**—From 1½ to 2 miles northward of Seaul Kebir Shab Umm Úsh reef, its edge clearly defined, and, except two rocks on its western and north-western side, with no outlying dangers. This reef does not uncover at low water.

SHAB ABU NAHAS (*Lat. 27° 34′ N., Long. 33° 56′ E.*). --About 2¼ miles northward of the northern side of Shadwán island and eastward of the above mentioned reef lies Shab Abu Nahas, which only uncovers at extraordinary low tides, and is the most dangerous of the group, it being the closest to the usual track of vessels passing up and down the gulf, only just on the verge of the limit of visibility of Ashrafi light, and within the obscured arc of Shadwán island light. A line drawn from Ashrafi lighthouse to the eastern extreme of Shadwán, as seen from that direction, touches the eastern point of Abu Nahas reef.

Clearing marks.—Jubal peak bearing W.N.W. leads 1½ miles north-eastward of Abu Nahas; and the south-eastern part of Shadwán bearing S.S.E. leads 2¼ miles eastward of it.

The water is very deep close to the northern and eastern sides of Abu Nahas, but south-westward and southward of it there is broken rocky ground.

SHADWAN ISLAND, or Isle of Seals, is nearly 8 miles long north-west and south-east, and 2½ miles broad at its widest part. It is high and rugged, with hills much cut up by ravines, the sides being rather steep. At a distance, Shadwán appears fairly flat. The highest hill, 990 feet, is near the south-eastern end of the island. Except at its north-western end, where two prongs of reef project a mile from the shore, deep water extends close in on the northern, eastern, and southern sides, there being a clearly defined fringe of coral reef from 20 to 40 yards wide with no outlying danger.

S. 34° E. Shadwan, distant about 7 miles. S. 11° W.

LIGHT (*Lat. 27° 27′ N., Long. 34° 2′ E.*).—From a circular stone lighthouse with a while rectangular dwelling at its base, at the south-eastern extreme of Shadwán island is exhibited at 120 feet above the sea, between the bearings S. 5° W. through west and north to S. 77° E., an *alternating flashing* light visible

Chart 2838, Straits of Jubal. Var. 3° W.

17 miles. The flashes show alternately *red* and *white* every *thirty seconds.* This light is therefore not visible to the northward and north-westward through an arc of 82°. *See* view on chart 2838.

Anchorage.—Rock.—On the western side of Shadwán, southward of the reef extending from the north-western end, a low sandy spit, projecting in a south-westerly direction, forms a bay on its southern side; in the middle of this bay, 8½ cables south-eastward from the sandy spit, is a coral rock having only 2 feet water over it, with 5 fathoms inshore and 6 and 7 fathoms on its southern side. Beacons on the shore formerly indicated the position of this rock, but by the year 1905 they had become unrecognizable.

The bay, however, to those with local knowledge, affords well-sheltered anchorage in 6 to 8 fathoms, sand and coral, with the end of the sandspit bearing N.W. ¾ W. 7 or 8 cables; outside this, the depth increases very suddenly to 40 and 100 fathoms. To anchor on the western edge of the shelf outside the rock just described, bring Jubal peak over the low land of the western extreme of Shadwán, to bear N.W. by N., and steer for it on that bearing until soundings are obtained.

Channel.—In a south-easterly direction from Shab Abu Rakau the cluster of coral reefs southward of Towila island, described at page 110, is a chain of islets and reefs terminating in the Carless reef, 16¼ miles from the south extreme of Towila. The chain leaves a clear and deep channel from 4½ to 7 miles wide between it and Shadwán island leading to Shadwán channel.

Shab Abu Melana (*Lat. 27° 25′ N., Long. 33° 52′ E.*), the north-western reef of the chain referred to, is a circular coral reef about 2 miles in diameter and covered at high water. It bears N.N.W. from Gumárh island, and there is a clear passage between the two reefs rather more than 2 miles wide, as also on its north-western side between it and the outlying rocks of Shab Abu Rakau. The nearest point of Shadwán, the sandspit before described, is 5⅓ miles distant to the north-eastward; and Shab Abu Jenzi is 2¾ miles distant to the south-westward. Its eastern and northern sides have deep water close to; but, on its western side are several outlying rocks and very irregular depths.

Gumárh island on with the peak of Jifátin Seríá, S. 18° E. leads eastward of Abu Melana reef.

Gumárh island is about 3 cables long north and south, one cable wide, and composed of coral cliffs 50 feet high; it is surrounded by a well-marked coral reef having deep water alongside, which, from its northern end, extends fully 7 cables

Chart 2838, Straits of Jubal. Var. 3° W.

in the same direction as the island. The island bears S. 54° W. 9 miles from Shadwán lighthouse.

Gumárh and Carless reefs lie, respectively, S. by E. one mile and S.S.E. ½ E. 3¼ miles from Gumarh island, and neither reef uncovers at low water. Carless reef (*Lat. 27° 18′ N., Long. 33° 57′ E.*), is small and not readily seen; Shab Sería ta umm Gumarh reef is about 3 cables long north and south and very narrow. Deep water surrounds both reefs. Jifátin Sería peak bearing westward of south, or Gumarh island; westward of N.W. leads eastward of both these reefs.

JIFÁTIN ISLANDS.—These islands, five in number, are situated from 12 to 17 miles southward of Shadwán island, and from one to 7 miles distant from the mainland.

Jifátin Sería (*Lat. 27° 12′ N., Long. 33° 59′ E.*), the second in size and, being the easternmost, is the most prominent to vessels navigating the gulf, it has a decided peak 330 feet high near the centre of its eastern side. From the northern end of this island, a reef extends in a north-westerly direction nearly 1½ miles, and continues as a fringe all round the island, but is very narrow on the eastern side. Deep water will be found at 2 cables from the eastern side of the island as well as from the eastern side of its northern reef.

Jifátin Kebir, the largest island, is about 6 miles long in a north-north-west direction, and 1¾ miles wide. From its northern end a rugged-topped hill commences and extends two thirds the length of the island, attaining near its centre a height of 350 feet. The southern end of the island is a decayed coral plateau from 10 to 20 feet high. Except on its north-eastern side, where the coast reef is a mere fringe, reefs extend in places a mile from the shore, especially on the north-western and western sides.

Anchorage (*Lat. 27° 20′ N., Long. 33° 58′ E.*).—A well-sheltered anchorage may be obtained in mid-channel between Jifátin Kebir and Jifátin Sería, in from 7 to 12 fathoms, coral and sand, with the peak of the latter island bearing about E. by N. ½ N. The shores on either side of the anchorage are fringed by wide coral reefs with several outlying rocks, so that, in entering, a good look-out from aloft is required. At the northern entrance, reefs nearly close the channel and render it so intricate that it cannot be recommended.

To enter the anchorage from the south-eastward, steer for the peak of Jifátin Sería; when about half a mile from the island bear up to the southward, hauling round the reef at the southern and south-western ends of the island, and thence northward into the anchorage.

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Chart 2838, Straits of Jubal. Var. 3° W.

Abu Rimathi (*Lat. 27° 10′ N., Long. 33° 59′ E.*), the south-eastern island of the group, is about 8 cables long north and south, very narrow, wedge-shaped, 63 feet high, and separated from Jifátin Sería by a deep channel 8 cables wide. Abu Rimathi is surrounded by a narrow fringe of coral, which becomes wider at the southern end where it extends 4 cables from the island.

Shab Abu Rimathi.—Southward of Jifátin Kebir are two coral patches, neither of which uncover, distant respectively 8 cables and 2½ miles. The latter, called Shab Abu Rimathi, is nearly 2 miles south-westward from the southern end of Abu Rimathi island.

Abu Mingarh island.—The extensive reef stretching 3 miles westward of Jifátin Kebir, and then 1½ miles in a northerly direction, embraces the low woody island Abu Mingarh, 10 feet high. Between the reef westward of Abu Mingarh and the headland of Dísh t'Abu Mingarh, 285 feet high, on the mainland, is the narrow Mingarh channel, with a least depth of 4 fathoms, as presently described.

Umm Gowísh (*Lat. 27′ 10′ N., Long. 33′ 52′ W.*).—Nearly in the centre of the bay formed by Jifátin Kebir and the mainland is the small decayed coral island Umm Gowísh, 15 feet high, and the south-westernmost of the Jifátin group, having a ledge of sunken rocks extending 1½ miles off its eastern and south-eastern sides. A bank with from 4 to 6 fathoms water extends from Umm Gowísh to Jifátin Kebir. Westward of Umm Gowísh is the Jifátin channel described at page 116.

INNER CHANNELS westward of Shadwán.—With regard to the various channels inside the islands, Captain. G. S. Nares, R.N., who surveyed the Gulf of Suez in 1872 in H.M.S. *Newport*, remarked that, in consequence of the prevailing north-westerly winds in this locality, steam-vessels of small power may gain considerably by using these channels when proceeding northward. He says "With a chart, and a good "look-out aloft, there is no difficulty in the navigation, the "difference in the colour of the navigable water and that on "the reefs being very apparent, except in a calm, or when "the sun is ahead." *See also* remarks on the visibility of coral reefs at page 3. These inner channels can, however, only be used by daylight; but if overtaken by night before getting clear of the reefs, there are many convenient anchorages in the channels.

There can be little doubt, however, that with the steady increase of steam power, vessels are likely to make less use of these channels every year.

General charts 757, 8a, and 2523.

Chart 2838, Straits of Jubal. Var. 3° W.

DIRECTIONS. — Shadwán channel from the southward.—The approach to this channel from the southward is 8 miles wide between Gumárh island and Shadwán and the channel is deep throughout. Carless and Gumárh reefs on the western side must be cleared by the marks already given. *See* page 113. Gumárh island on with Jifátin Sería peak S. 18° E. leads 3 cables eastward of Shab Abu Melana, also on the western side of the channel. To clear the reef extending from Shadwán, the southern extreme of that island should be kept eastward of S.E. by E. ½ E. until Seaul Kebir islet bears north of N. by W. The two low sandy eastern points of Towila island in line N.N.W. ½ W. leads in the fairway to the narrows. On this bearing, part of South Gaysúm island is seen between Towila and the small islets on the reef connecting Towila with Jubal island. Sometimes it is difficult to distinguish the low point of Towila from the sandy islets between Towila and Jubal; in which case the mark given above for clearing Melana reef, astern, will lead into the fairway of the narrows.

When Jubal island peak bears N. 16° W. steer for it until the south end of Towila hills is abeam.

Abreast of the highest eastern part of Towila, the Seaul reefs will have been passed, whence a N.N.E. ½ E. course will lead into the fairway of the Strait of Jubal, avoiding the reefs off the bay between Towila and Jubal. Sandy cay, off the southern end of Towila, bearing S.W., leads eastward of the Towila reefs.

If the sea should prove to be heavy in the open strait, a steam-vessel of small power may still gain some advantage to the northward either by taking one of the passages westward of the Ashrafi islands, as presently described, or by crossing the strait with the assistance of fore and aft sails and taking the Inner channel eastward of Shab Ali. *See* page 118.

Channels westward of Ashrafi reefs.—If there be much sea in the open, shelter will be gained by passing in to the westward immediately northward of South Gaysúm island, between it and Sandy islet, which islet marks the southern end of the Ashrafi reefs; then through the Kowarat or the northern part of Zeiti channel; but these channels are very intricate and require a good look-out from aloft while passing the narrows. In April 1887 H.M.S. *Flying Fish*, to avoid the sea in the strait, used this part of the Zeiti channel; Captain Maclear remarks, "The rocks on the south side of the entrance could not be plainly seen from aloft although the light was very favourable."

Zeiti channel.—This channel is 12½ miles long from its northern entrance (*Lat. 27° 50′ N., Long. 33° 37′ E.*), between

Chart 2838, Straits of Jubal. Var. 3° W.

Umm-el-Kyamah and Shab Ashrafi, to its southern end between South Gaysúm and the reefs westward of it; its northern portion is wide and comparatively clear, but the southern part is almost closed by reefs. From this channel, small craft can pass over the reef connecting Shab Ranim with Shab Labeit and thus enter the open water connecting with Gimsah anchorage to the southward and leading to the entrance of Ghubbet ti Zeiti to the northward. There is a channel into it for small vessels by the Gaysúm pass, westward of Gaysúm islands; but the Pass between South Gaysúm and Mulhaimet Sería is extremely tortuous, and being full of mushroom-shaped coral rocks, requires very careful navigation. There is also another entrance westward of Mulhaimet Sería, even more tortuous than the last, and 4½ miles in length before more open water is reached.

JIFÁTIN CHANNEL (*Southern entrance, Lat. 27° 15′ N., Long. 34° E.*).—This is the in-shore passage westward of the Jifátin islands and has a least depth of 4 fathoms.

Directions from the southward.—If certain of the ship's position, the African shore may be closed with anywhere northward of the Safája reefs, there being no outlying dangers on that part of the coast. After passing about a mile eastward of the small islet Saal Hashish, 10 miles southward of Jifátin Sería island, steer N.N.W. ½ W., until the low coral island Umm Gowísh and the rocky islet El Ghyaria, just westward of it, are plainly in sight, the hills of the headland of Dísh t'Abu Mingarh being seen over and between them. The entrance to the deep and safe Jifátin channel is 5 cables wide between Umm Gowísh on the starboard hand and El Ghyaria with the large reef Shab et Lug on the port hand. Do not allow El Ghyaria to bear westward of N.W. by N. until the channel is fairly open; then alter course as requisite.

Immediately westward of Umm Gowísh the channel is deep and clear of danger.

In passing between the mainland and Abu Mingarh island reef, be careful of the shallow water south-eastward from the headland of Dísh t'Abu Mingarh, which from being deeper, is not so easily distinguished as the coral reef on the eastern side. At this part, the navigable width of the channel between the island and mainland reefs is only about 2 cables, and here a narrow bar with from 4 to 5 fathoms crosses the channel; northward of this narrow bar the water deepens quickly.

After passing northward of Abu Mingarh and its reefs, the channel widens, and a vessel should steer about N.N.E. with Gumarh island in sight a little on the starboard bow, and the

Chart 2838, Straits of Jubal. Var. 3° W.

small rocky islets of El Fanadeir, 15 feet high, on Shab-el-Fanadeir, broad on the port bow. When Dísh t'Abu Hurghada, a remarkable flat-topped hill, 196 feet high, 3½ miles northward of Jebel Dísh t'Abu Mingarh bears West, distant about 2 miles, which is half a mile eastward of a two-fathom patch, a course may be steered to pass on either side of Shab Abu Jenzi, a reef which covers at high water.

The passage eastward of Abu Jenzi is the better of the two, as it is well marked by Gumárh island; in taking it, steer North, keeping El Fanadeir islets well open westward of Abu Hurghada until Gumárh island bears E.S.E. The vessel may then pass on either side of Shab Abu Melana into the Shadwán channel, already described, or the course may be altered to N.W. ½ N., leading up inside Abu Melana, Abu Rakau, and Towila reefs to the southern entrance of the Towila channel, which enters the Strait of Jubal 7 miles farther northward than does the Shadwán channel.

Cross bearings.—In this navigation, a ship's position is better determined by bearings of the flat peak of Jebel Esh on the mainland of Shadwán, and of Jubal, than by any bearings of the low flat Towila island.

Towila channel.—Assuming that the inshore and Towila channels are taken:—When Jebel Esh bears W. ½ S., distant 7½ miles, alter course to N. by E. ½ E. for Vahari Towila, a small low sandy islet on the north-western side of the channel and 2¾ miles southward of South Gaysúm island. The islet will soon be sighted ahead in line with a dark nipple hill on South Gaysúm. Jubal peak N.E. by E. ½ E., seen a little within the northern point of Towila island, leads through the passage, half a mile, wide between Vahari Towila and the large reef off the western side of Towila, which uncovers at low water. There are strong and uncertain tidal streams in the narrows and the depths are from 6 to 8 fathoms.

After passing Vahari Towila, steer N.E. by N. for the low islets on the reef northward of Jubal island until Ashrafi light opens out eastward of South Gaysúm, when the course must be altered to the northward to get out into the open strait; or, if preferred, to haul round the northern end of South Gaysúm into the channels westward of Ashrafi reefs; *see* page 115.

Gimsáh anchorage (*Lat. 27° 39′ N., Long. 33° 36′ E.*).—The best approach to the petroleum wells of Gimsah is by the Towila channel until within about 2½ to 3 miles southward of Vahari Towila island, when, turning off to the north-westward, a channel has to be found between the reefs and up the western side of Shab Mulhaimet, and thence through a very narrow pass with 5 fathoms water between Shab Labeit and Shab Gimsah to the anchorage; the approach appears to be available

Chart 2838, Straits of Jubal. Var. 3° W.

with care for vessels of 18 feet draught, with the sun in a favourable position.

The anchorage off the petroleum wells is exposed to the northward, and a nasty short sea soon gets up with the wind from that direction. The wells are not being worked. The best anchorage is in the basin close southward of Shab Gimsah, entered from Ghubbet Gimsah.

Ghubbet Gimsah is about 7 miles in length by 2 miles in breadth, with depths of 8 to 10 fathoms; it is reduced in one place to a width of half a mile by the reefs extending from either side.

The wells are within 2 miles of Ghubbet Ti Gimsah, which is easy of access.

EASTERN SHORE.—Shab Ali reef (*Northern end, Lat. 27° 55′ N., Long. 33° 49′ E.*)—(*continued from page* 106).—The nearest part of the numerous coral reefs forming Shab Ali, on the eastern side of the Strait of Jubal, is 7 miles distant from Ashrafi lighthouse, and their outer edge is from 7 to 8 miles from the eastern shore of the gulf; they narrow the navigable channel to 6½ miles. These reefs extend nearly 9 miles in a south-south-east direction from their northern end, and do not uncover at low water, with the exception of the small Shag rock at the southern end, which is 3 feet high, and bears E. ¾ S. 9½ miles from Ashrafi lighthouse.

In thick weather, when near Shab Ali, do not shoal to less than 20 fathoms. Within 2 miles south-eastward of its southern end there are depths of 200 fathoms and upwards.

Inner channel.—Inshore of Shab Ali there is a good channel, useful to steam-vessels of small power; it is nearly 9 miles long and 1¾ miles wide at its narrowest part, where Shab Itiguyig, an extension of the shore reef, stretches off towards it more than 3½ miles and connects with it by a narrow neck or bar with depths of 8 to 9 fathoms. At either end of the channel it is deeper, from 15 to 20 fathoms being about the average. The channel may be safely used during the day; about a N.N.W. course leads through it, but a good look-out must be kept for detached rocks, especially near the northern entrance, where the Azov patch lies well out in the channel; and, again, in steaming out into the strait, the Poynder shoal of 3 fathoms must be carefully avoided.

Anchorage.—In nearly all parts of this inner channel, there is anchorage in smooth water and moderate depth; vessels may also take temporary shelter under the southern end of the reef, near the Shag rock, in from 15 to 20 fathoms.

Sheltered from the prevailing northerly winds by Shab Ali and by the shore reefs, are the two anchorages of Mersa Tal Kad Yayah and Mersa Towila, and, farther southward, that under shelter of Shab Mahmoud.

General charts 757, 8a, and 2523.

Chart 2838, Straits of Jubal. Var. 3° W.

Mersa Tal Kad Yayah (*Lat. 27° 56′ N., Long 33° 51′ E.*).—This harbour, 2 miles eastward of the low sandy point Ras Iknaisi, affords the best shelter on the eastern side of the gulf. It is protected by the reef extending south-eastward from Ras Iknaisi. In the entrance is Shab Ryeis consisting of two reefs connected by shoal water. Northward of these reefs is the best channel into the harbour, more than 3 cables wide, with depths of from 10 to 12 fathoms. On hauling to the northward round the eastern end of Ras Iknaisi reef into the harbour, the depth decreases very gradually, and anchorage may be taken up in from 10 to 6 fathoms, mud.

Between Shab Ryeis and the northern tongue of Shab Itiguyig, is another entrance to the harbour from the southward, but in it are several shoal patches of one and 2 fathoms, rendering it much more intricate than the northern channel; it can however be used if necessary, provided that a good look-out is kept from aloft. Shab Ryeis is awash at low water.

Mersa Towila (*Lat. 27° 51′ N., Long. 33° 59′ E.*), is nearly 7 miles south-eastward of Mersa Tal Kad Yayah; it affords protected anchorage in from 5 to 8 fathoms, sand and coral, and, for small craft, there is very extensive anchorage in from 2 to 4 fathoms, completely sheltered on the western side, by Shab el Megether, an outer south-eastern extension of the shore reef. The entrance is at the south-eastern end of this reef, and the anchorage is nothing but a bight in the shore reefs, the coast itself not forming any considerable bay at this part. There is a depth of about 6 fathoms in the entrance, and several coral reefs, but with a good look-out from aloft, it may be entered without danger. From the entrance, Jebel Towila, 1,560 feet high, bears N.N.E. ½ E. 6½ miles.

Shab Mahmoud (*S.E. extreme, Lat. 27° 42′ N., Long. 34° 8′ E.*).—Southward of Mersa Towila, and 3½ miles distant from the entrance, the outer edge of Shab Sérur is 2¾ miles from the shore, with a passage 5 cables wide between it and the coast reef, which from this spot begins to trend off shore, and stretches south-eastward for 7 miles, forming Shab Mahmoud. This reef has, at its south-eastern extreme, two rocks 2 feet high; the outer rock, known as Beacon rock, is 5¼ miles from the nearest land. The remainder of the reef does not uncover at low water, and there is only one break in its whole extent, 5¾ miles from the south-eastern extreme. From the Beacon rock, Ras Muhammed bears E. ¾ N. 6¾ miles.

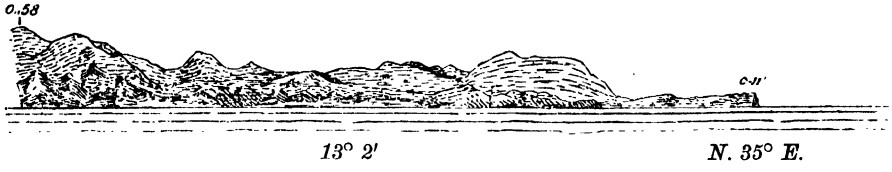
Anchorage.—There is extensive anchorage under the lee of Shab Mahmoud, and between it and the adjacent reefs of Shab el Ottaf; an excellent berth is with Beacon rock bearing

Chart 2838, Straits of Jubal. Var. 3° W.

S.W. by S. $1\frac{1}{4}$ miles, and Black hill, near Ras Muhammed, E.N.E. Here there are from 8 to 10 fathoms, sand and coral. There is a narrow intricate 3-fathoms channel to the anchorage through the break in the reef above mentioned, and between it and the shore reefs, but it cannot be recommended.

RAS MUHAMMED (*Lat. 27° 43′ N., Long. 34° 15′ E.*), the south-eastern extreme of El Gaáh or the Sinai peninsula and also the southern boundary, on the eastern side of the Strait of Jubal, is an abrupt broken cliff with a flat top, 90 feet high but decreasing in height to a low plain of gravel and decayed coral a little northward of the cape. In the centre of the plain is Black hill, a remarkable black rounded hillock 190 feet high, with a flat sand-coloured table-hill of nearly the same height, south-eastward of it. From the westward, in mid-channel, these hills resemble islands, with the distant island, Tirán, at the entrance of the Gulf of Akaba, showing behind them.

Ras Muhammed should be carefully approached at night, as the white cliffs and land are not easily seen. It has deep water with no outlying dangers on its north-eastern and southern shores.



Anchorage. — Westward and north-westward of Ras Muhammed, the coral reef Shab el Ottaf extends about 5 miles off-shore with many sunken coral rocks near its edge. If necessary, an indifferent anchorage may be obtained amongst them, with Black hill bearing from N. by E to N.E.

DIRECTIONS for JUBAL STRAITS.—Steam vessels, or sailing vessels with a fair wind, approaching Jubal strait from the northward, should keep on the western side of the gulf.

To clear the reefs on the western side of Jubal strait. In approaching Ashrafi lighthouse vessels will clear all dangers northward of it by keeping the eastern side of Shadwán on with or open eastward of the lighthouse until abreast Zeiti hills, whence course may be shaped to pass about 3 miles eastward of Ashrafi lighthouse and of Shadwán island, through the fairway of Jubal straits. As the light is neared, Jubal peak, bearing S. by E. $\frac{1}{2}$ E., leads nearly 2 miles eastward of it and of the Ashrafi reefs; after they are passed, the lighthouse should be kept in on, with the north-western part of the Zeiti

Chart 2838, Straits of Jubal. Var. 3° W.

hills bearing N.W. which leads $1\frac{1}{4}$ miles eastward of Shab Jubal and of Shab Abu Nahas; or, the south-eastern part of Shadwán bearing S.S.E. leads $2\frac{1}{4}$ miles outside the latter reef.

To clear the reefs on the eastern side of the strait:—after passing Ashrafi light, it should not be brought westward of W. by N. $\frac{1}{2}$ N. When the light has dipped, the eastern extreme of Shadwán should not be brought westward of S. $\frac{1}{2}$ W., nor Shadwán light opened out, as it will be on a S. $\frac{3}{4}$ W. bearing, until the peak of Jubal island bears W. $\frac{1}{2}$ S.; this leads clear of Shab Mahmoud.

These directions, taken in reversed order, apply equally to vessels from the southward.

In thick weather, do not shoal the water towards Shab Ali to less than 20 fathoms, and to keep a central position in the channel through the strait, a depth of 40 fathoms or more should be maintained.

Working to windward through the strait of Jubal from the southward; a sailing vessel with the usual north-westerly breeze having worked up to Ras Muhammed which may be safely approached to a distance of half a mile, should then stand to the westward, when the peak of Tirán island on with the flat sand-hill on Ras Muhammed will lead southward of Shab Mahmoud. The Beacon rock and the other, both 2 feet high, which mark the southern part of Shab Mahmoud may be seen 3 miles distant; therefore work to windward under the lee of that reef, passing close to its edge.

In standing across the strait to the westward, tack when the reefs northward of Shadwán are closed with. The outer edges of the reefs on either side of the strait are steep-to, with no outlying dangers, and all are distinctly visible by day, except the reef immediately southward of Ashrafi lighthouse, which should be more carefully approached. If there is any sea, their breakers will probably be visible.

Northward of Umm-el-Kyaman islet, on the western shore, the gulf opens out, and with the help of the chart, there should be no difficulty in beating to windward during daylight with a fair tide, or in obtaining an anchorage before night.

In the Straits of Jubal, vessels working to windward are recommended to anchor at night, instead of making short tacks and risking being driven to leeward again. The best anchorages, all easily entered and parted from, and all described in the preceeding pages, are eastward of Shab Mahmoud and of Shab Ali reef on the eastern shore; southward of Jubal island near the fairway; and southward of Umm-el-Kyaman islet, near the southern point of the Zeiti hills.

General charts 757, 8a, and 2523.

CHAPTER IV.

RED SEA CENTRAL DANGERS, ALSO WESTERN SHORE OF THE RED SEA FROM JIFÁTIN ISLANDS TO KHOR NOWARAT, INCLUDING THE SUÁKIN GROUP.

(*Lat. 27° 10′ N., Long. 34° 15′ E. to Lat. 18° 12′ N., Long. 39° E.*)

VARIATION IN 1909.—Decreasing 4′ annually.

Chart 757, Gulf of Suez.

RED SEA.—Dangers in the fairway.—Having in the preceding pages described the Suez Canal, with the Regulations and Directions for its passage, and also to Gulf of Suez, a description of the shoals and islands lying in or near the usual track of full-power steam vessels through the Red Sea, as described in Chapter I., is now given. The only shoals in the Gulf of Suez which can be properly called central are the Sheratíb, which extend from the eastern shore off to the centre, and the Moresby shoal of 3 fathoms which is absolutely central.

The central islands and shoals of the Red sea are as follows:—The Brothers islets, Dædalus reef, Jebel Teir island, Zebayir islands, Avocet rock, Jebel Zukur and Abu Ail islands, Haycocks, and Mohabbakah islands. With the exception of the first two, they all lie in the southern part of the sea.

Plan of The Brothers on chart 8b. Var. 2° 30′ W.

THE BROTHERS (*Lat. 26° 19′ N., Long. 34° 51′ E.*) are two small coral islets, lying north-west and south-east of each other, with a passage between them one mile wide. The north-western islet, 33 feet high, is 3 cables long, and less than a cable wide. The lighthouse, presently described, stands near its centre; on the south-western side of the islet an iron jetty, 180 feet long, extends to the edge of the reef. The south-eastern islet, 20 feet high, is one cable long, and about half a cable wide. From the north-western end of the larger islet, the fringing reef extends rather more than half

Plan of The Brothers on chart 8b. Var. 2° 30′ W.

a cable, and there are 3 fathoms a short distance off the north-western end of the smaller islet; with these exceptions, both are steep-to.

The depths around and between them are from 100 to 250 fathoms, and there are no indications of shoal water or of off- lying danger in any direction.

LIGHT.—From a circular white lighthouse 102 feet high, with a white rectangular dwelling house at its base, on the north-western islet of the Brothers, and at 119 feet above high water, is shown, a flashing *white* light with a *five-seconds* period, visible 17 miles. The flashes show thus:—flash, *half a* second; eclipse, *four and a half* seconds.

From Shadwán lighthouse, the Brothers lighthouse bears S.S.E. $\frac{5}{8}$ E. about 80 miles. Before the establishment of the light, these islets might be seen 10 or 11 miles off by day; but, at night, even in very clear weather, they could not be distinguished at more than one or two miles distance. In passing the Brothers, especially at night, it is best to give them a fairly wide berth, as a cross current often sets westward in their vicinity.

Tides.—It is high water, full and change, at The Brothers at 6h.; the rise is 2 feet.

Plan of Dædalus shoal on chart 8b.

DÆDALUS REEF *(Lat. 24° 55′ N., Long. 35° 52′ E.).*—The Dædalus reef may be passed on either side; it bears S.S.E. $\frac{5}{8}$ E. 100 miles nearly from The Brothers light; it consists of coral, with its surface a little below low water, and is 6 cables long north-west and south-east by $2\frac{1}{4}$ cables wide. There is very deep water close to its edge all round. A sandbank, several feet high, is periodically formed on this reef, and is washed away every year when the sea rises and strong winds blow.

LIGHTS.—The lighthouse on the Dædalus reef stands a cable within the south-eastern extreme of the shoal; it is of open iron framework, painted red, on a masonry base; from it is shown at 61 feet above high water, a *fixed white* light visible 14 miles. *See* view on chart, 8*b*.

Charts 8, b, c, and d, Red Sea, sheets 2, 3, 4, 5.

From the Dædalus reef to Jebel Teir the distance is 656 miles in a S.S.E. $\frac{1}{2}$ E. direction, and is clear of central dangers; but this line takes a vessel much nearer the eastern than the western side of the channel, and she would have to keep more in the centre after passing the outlying shoals of the Suákin group, and when between the parallels of 18° and 17° N.

General charts 8a, 8b, and 2523.

Chart 143, Jebel Teir to Perim. Var. 2° 20′ W.

JEBEL TEIR ISLAND (*Lat. 15° 32′ N., Long. 41° 49′ E.*) is steep-to, and may safely be run for, the weather in the Red sea being seldom so thick as to prevent such high land being seen by day or its light by night, except as presently explained. From the north-west and south-east, it appears high and conical in the centre, sloping gradually towards the extremes. It is nearly circular, being about 1¾ miles in extent from north to south, and 1½ miles wide, with depths of 50 and 60 fathoms close to.

Jebel Teir rises about 800 feet above the level of the sea; from the base, it has a gradual ascent for half a mile, where a range of hills, about 300 feet high, commences and terminates in a steep rocky yellow bluff on the south-eastern part of the island. From the top of this range is another gradual ascent to the peaks, which are also about 300 feet in height. The largest peak is of a brown colour, and the other forms a beautiful cone when seen from the south or west. The island is of recent volcanic origin, and composed chiefly of lava; sulphurous steam jets are found at the summit, but no smoke has been seen to issue for some years past.

This island is known by three names: the Indians call it Jebel Teir, or hill of birds; the Shuris of Sohar near Maskat, Jebel Dokhan, or hill of smoke; and the Arabs and Abyssinians, Jebel Sebain, or hill without anchorage.

Landing.—There is good landing in a small cove on the north-western side at the foot of a valley in which are several bushes. There is, however, no anchorage, and the island is without water.

LIGHT.—From a red iron cylindrical tower with white lantern, 65 feet high near the south-eastern point of the island, and at 531 feet above high water, is exhibited a *flashing white* light with a *five-seconds* period, the duration of the *flash* is *one-tenth* of a *second*. It is visible 30 miles, but in approaching from the northward it is masked during an arc of several degrees by the highest portion of the island.

Soundings.—In crossing westward from the reef off the northern end of Okban island for Jebel Teir, 8 fathoms are found on the tail of Kotama reef; 16 miles from Okban, 38 fathoms, and, shortly after, the 100 fathoms line of soundings is crossed at about 12 miles from Jebel Teir. On the western side of Jebel Teir the 100-fathoms line is about 10 miles distant; and on both sides, between this line and the island, the water is very deep, from 300 to 700 fathoms. After passing the 100-fathoms line westward of Jebel Teir the water quickly shoals to 50 and 30 fathoms towards the African shore, and within 18 or 20 miles from Jebel Teir, on this side, there are patches of 16 or 18

Chart 143, Jebel Teir to Perim. Var. 2° 20′ W.

fathoms. Shoals have at various times been reported in this neighbourhood, but, though carefully searched for by vessels detailed for the purpose, they have never been found, and it is probable that unless those who reported them were deceived by the appearances before alluded to (*see* page 27), the shoals lie considerably farther westward on the Dahalak bank, and therefore that the vessels themselves were out of the track.

Chart 453, Zebayir islands.

ZEBAYIR ISLANDS.—This group of ten islets, besides rocks and shoals, extends in a north-north-west and south-south-east direction, a distance of 13 miles. They are rugged and almost entirely devoid of vegetation, except in Saba where a few stunted bushes grow. Arab fishermen from Kamaran occasionally visit the islands. Centre Peak, the south-west island, has a light.

Zebayir islands west extreme bearing N. 82° W.

Jebel Zebayir (*Lat. 15° 3′ N., Long. 42° 11′ E.*), the south-easternmost island of the group, is the largest; it is about 3 miles long north and south, and 2 miles wide. It has three remarkable hills; one, 734 feet high, forming a cone, on the southern end, another 532 feet high, of a square shape, near the northern end; and, between the two, is the third or centre hill, 627 feet high. Centre-peak island, the next largest of the group, lies south-westward of Zebayir island; all the others are between Zebayir and Quoin island.

Between Zebayir and Centre-peak islands is a channel nearly 5 cables wide, with from 15 to 20 fathoms water, through which the current runs strongly in a fresh breeze.

Centre-Peak island (*Lat. 15° 1′ N., Long. 42° 10′ E.*), the south-westernmost of the group, is rather more than a mile in diameter and nearly circular, with a small bay on its south-western side; rising from a rocky shore, it forms three hills, the central one, 566 feet high, on which stands the lighthouse, being the highest. The island is steep-to, and the water so deep that the lead is of but little use in the approach.

LIGHTS.—From a white iron cylindrical lighthouse, 65 feet high, on the summit of Centre-peak island, and at 633 feet above high water, is exhibited a *group-flashing white* light,

Plan on 453, Zebayir islands Var. 2° 20′ W.

visible 30 miles, except from the northward and north-eastward, where, between the bearings of S.W. by W. and S.S.E., it is much obscured by the other islands of the group. The flashes show in the following order:—*a group of three flashes*, each *one-tenth of a second* duration, at intervals of *ten* seconds.

Saba island, north-westward of Jebel Zebayir, is about a mile in extent, nearly round, and consists of a sandy plain from which rise two remarkable hills; the highest, 381 feet high, resembles a barn when approached from the eastward; both hills have craters. The island has also two lagoons, connected with the sea, and fringed with mangroves.

Connected island is a rugged-topped rock, 473 feet high, of remarkable shape, about 5 cables south-westward of Saba island and connected with it by the coral reef which skirts the shores of both islands, on the eastern edge of which is the Shoe rock, 17 feet high.

Anchorage.—Between Jebel Zebayir and Saba is a channel about 5 cables wide, but, for vessels of deep draught, narrowed to less than half that width by shoal water extending from each side. Anchorage, with shelter from the prevailing winds, may be obtained in from 8 to 10 fathoms in the centre of this channel, the southern hill of Jebel Zebayir bearing S.S.E., the northern extreme of that island E. by N. ½ N., and the Shoe rock nearly on with the northern extreme of Connected island.

Middle reef, 1½ miles north-north-west of the high hill on Saba island, and nearly 2 miles south-eastward from Table-peak, is of coral, about 2½ cables in extent, and has deep water within a short distance. The reef breaks when there is any swell. The northern extreme of Saba island on with the summit of the northern hill of Jebel Zebayir S.E. ½ S. leads westward of the reef.

Low island, Saddle island, Table-peak, and Rugged island.—Saddle island, 583 feet high, Table-peak, 526 feet, and Rugged island, 510 feet, are each about 5 cables long and barren in appearance; they are on a rocky bank which extends from them one mile southward and south-eastward. Here, 5 cables southward of Saddle island, is Low island, about 2 cables long and 125 feet high; and, nearly 5 cables eastward of Low island, is a rock 26 feet high. About 5 cables north-westward from Saddle island are other rocks above water, with deep water between them and the island; the highest of these rocks is 83 feet.

Between Saddle island and Table-peak, there are from 3 to 5 fathoms across the bank, and between Table-peak and Rugged

Plan on 453, Zebayir islands. Var. 2° 20′ W.

island, 6, 9, and 17 fathoms, rock and sand. Between Saddle island and the rock eastward of Low island, there are 5 fathoms.

Haycock island, 545 feet and steep-to, is $1\frac{1}{4}$ miles north-north-east from Rugged island, and south-eastward nearly $3\frac{1}{2}$ miles from Quoin island, there is a navigable passage about a mile wide between it and Rugged island. Between it and Quoin island are patches with as little as 9 or 10 fathoms, and very deep water close to.

Quoin island (*Lat. 15° 12′ N., Long. 42° 4′ E.*).—The northernmost islet of the group is in the shape of a quoin, the highest part to the south-west being 100 feet high, not more than a cable long, and being of a light brown colour it is not easily distinguishable by night. If passing close to the Zebayir islands a good look-out should be kept for it. There is, however, deep water within $2\frac{1}{2}$ cables of it.

The off-lying rocks and shoals of the group are all towards its southern and eastern sides. They are as follows:—

East rock, 5 feet high, lies N.E. $\frac{3}{4}$ N. $3\frac{1}{10}$ miles from the northern peak of Zebayir island; and, $1\frac{1}{2}$ cables north-westward of East rock is a sunken rock. The sea often breaks heavily on these dangers, which have deep water within 5 cables on all sides.

Williamson shoal, nearly 3 cables in diameter, lies between East rock and Jebel Zebayir, its shoalest spot of $5\frac{1}{2}$ fathoms being about 8 cables from the latter.

Evans rock, E. $\frac{1}{4}$ S. about $1\frac{1}{2}$ miles from the southern point of Jebel Zebayir, is a small pinnacle with only 4 fathoms; there is a depth of about 10 fathoms within a cable all round the rock.

Shark shoal, a coral reef, about 5 cables in extent, lies $2\frac{1}{4}$ miles south-eastward from Centre-peak island. This shoal, so named from the large number of sharks seen on it, has a depth of 7 fathoms in its centre and is surrounded by deep water. Tide rips are often seen in its vicinity.

PENGUIN SHOAL (*Lat. 14° 57′ N., Long, 42° 20′ E.*).—About 10 miles south-eastward of Zebayir island, in 1888, H.M.S. *Sylvia* obtained soundings in 14 fathoms, rock. No shoaler water was then found; but, in 1890, H.M.S. *Penguin* discovered as little as 22 feet at this spot. The locality has not yet been completely examined, but this shoal lies exactly in the track of ships passing eastward of the Zebayir islands, which, however, is not recommended, as there may be other similar shoal spots in the neighbourhood.

General charts 143, 8d, 8e, and 2523.

Chart 143, Jebel Teir to Perim. Var. 2° 20′ W.

AVOCET ROCK (*Lat. 14° 22′ N., Long. 42° 42′ E.*).—This dangerous rock was discovered by the steamships *Avocet* and *Teddington* striking on it in the year 1887. After three ineffectual searches, it was re-discovered by H.M.S. *Stork*, Commander T. J. Pullen, in 1888, and its correct position fixed. It is a small coral patch, with a least depth of 15 feet, and from 28 to 30 fathoms close to all round; from it, the highest peak of Jebel Zukur summit bears S. 5° E., distant 21 miles.

Directions.—In passing westward of the Zebayir islands, and steaming against a southerly gale, so commonly met with during the winter season, it is advisable to give them a berth of at least a mile, as the set of the swell is towards the rocks.

From that distance westward of Centre-peak island to mid-channel between Jebel Zukur and Abu Ail the course and distance is S. 44° E. 66 miles, and as this course only leads 5½ miles westward of the Avocet rock, a vessel should be kept somewhat southward of that course until certain of being westward of that rock bearing in mind also the repeated cautions given as to cross currents so frequently experienced in this sea.

Bank.—In 1892, a sounding of 18 fathoms was reported by the s.s. *Yarra*, as having been obtained near the track usually followed north-north-west of Jebel Zukur island, and S. 77° W., distant 7½ miles from the Avocet rock. This locality was examined by H.M.S. *Egeria*, 1894, when the least depth found was 35 fathoms.

Plan 453, Plan of Jebel Zukur and Hanish islands.

JEBEL ZUKUR and HANISH ISLANDS.—(*North extreme of Jebel Zukur, Lat. 14° 4′ N. Long. 42° 45′ E.*).—The islands comprising this group are mostly volcanic hills of a dark barren aspect, with rocky eminences in fanciful shapes, covered with a loose, granular, black, brown, or sandy-coloured earth and ashes, or strewed with pieces of sharp rock. The principal islands are Jebel Zukur and Great Hanish; they are surrounded by many smaller ones of various heights, named chiefly according to their different shapes. In some of the largest the craters are very evident, having all the appearance of being originally high peaked islands, reduced to the present saucer shape by internal explosions. The neighbouring smaller islands and rocks east-south-east, south, and south-west of Great Hanish are of similar formation.

From the southern end of Jebel Zukur to Ras Beilul on the African shore, a distance of 43 miles, these islands, islets, and

Plan on 453, Jebel Zukur and Hanish islands. Var. 2° 20′ W.

rocks form a continuous chain extending in a south-south-west direction, Sayal island, the southernmost of the group, being only 6 miles from that point.

Chart 143, Jebel Teir to Perim.

Tides and currents.—It is high water, full and change, on the northern side of Jebel Zukur, at 1h.; springs rise 2½ feet, neaps one foot, according to observations made by H.M.S. *Fawn* in February, March, and April, 1881. The tidal streams are very irregular, but along the shores of the island they appear to be constant. At the anchorage at the northern end of Jebel Zukur, H.M.S. *Thalia*, in 1872, found the flood set south-westward at 2½ miles an hour, and the ebb north-eastward. Between Low island and Little Hanish, the ebb runs to the southward, and continues running 1½ hours after low water at Jebel Zukur; the flood sets northward about 6 hours, along the eastern coast of Great Hanish, at nearly a knot an hour. The ebb sets strongly to the southward round the south-western coast of Great Hanish; off Haycock island, tide rips are visible and the ebb sets south-eastward.

In the month of May, off 3-foot rock (south-westward of Suyul-Hanish) a constant current was observed setting S.S.E., 1½ knots an hour.

Lieut. Frederick, H.M.S. *Sylvia*, remarked on the currents in the southern part of the Red sea in 1887:—"Between "Jebel Teir and the Zebayir islands an easterly set of nearly "a knot an hour was experienced in the month of December; "the wind at the time and for at least two days previously "was nearly calm and the sea perfectly smooth. On two "previous occasions I have noticed the same phenomenon "when passing Jebel Teir, and in one instance the easterly "set continued for 10 or 15 miles north of Jebel Teir.

"While sounding in the vicinity of Ras Mujamela and of "the Avocet rock during the months of October, November, "and December, little or no current was experienced, although "the southerly wind was blowing almost continuously.

"On the Egyptian coast, between Rakhmat island and Ras "Fatima, a northerly set of about three quarters of a knot was "experienced; and from abreast of Ras Makawar to Perim, "the current was running nearly 2 knots an hour in the centre "of the channel."

In 1888, the same officer remarked, that from 20th May to 1st June, "between Jebel Teir and the Zebayir islands and "the 100-fathoms bank to the eastward, the general set of the "current was to the northward (N.W. by N. to N.N.E.) with a "rate of from one-tenth of a knot to one knot an hour. On

General charts 8e, and 2523.

Chart 143, Jebel Teir to Perim. Var. 2° W.

" the bank, the current was very erratic; opposite Jebel Teir, " generally to the southward, but, farther south, to the " eastward and northward.

" During June, the current between Zebayir islands and " Jebel Teir was inappreciable.

" From Hanish islands to Perim, with a strong north- " westerly breeze, the current was 1½ knots S. by E., but with " a light breeze from the same direction, it was south three- " tenths of a knot."

Plan 153, Jebel Zukur and Hanish islands.

JEBEL ZUKUR (*North point, Lat. 14° 4′ N., Long. 42° 45′ E.*), the highest island in this sea, is nearly 10 miles long from north to south, by 7 miles wide, and is composed of a series of lofty hills of barren aspect, which in some views appear as sharp peaks. The highest peak is 2,047 feet in height. The northern coast of Jebel Zukur is fringed by a reef which, westward of North point, which is low and sandy with a few green bushes near it, extends about 5 cables from the shore. West point, as also all the points on the western, southern, and eastern coasts, as far as East point, may be approached within 2½ cables.

Jebel Zukur *from Northward.*

Between North and East points, however, the shore, which forms the western side of the Abu Ail channel, is fringed by a reef, which, in some parts, extends nearly 2 cables off; East point, low and rocky, is almost steep-to, with the exception of a rock with 2½ fathoms of water, 2 cables east-north-east from the point; this part of the island, therefore, should be given a wider berth.

A bank with 12 fathoms lies 1¼ miles eastward from East point.

Anchorages.—Shelter may be found from a southerly wind on the north-eastern side of the island in the bay northward of East point, but a swell sets into the bay. There is a small

Plan on 453, Jebel Zukur and Hanish islands. Var. 2° W.

Turkish garrison here living in huts on the beach. There is good shelter near the northern end of Jebel Zukur in 11 fathoms, sand and coral, with the southern end of Quoin island (Abu Ail) just open of North point, bearing East; an ancient tomb near the beach S. by W. ¼ W.; and the highest peak of Jebel Zukur S. ⅞ E. The tomb is a square building of naturally dark stone.

In this berth a vessel lies 2½ cables from the fringing coast reef, and opposite an opening through which boats may pass and lie securely inside; the opening, however, is narrow, and to avoid a dangerous rock on the eastern side, boats should keep as close as possible to the breakers on the western side.

Off the north-western coast generally, there is anchorage in from 7 to 10 fathoms close in, and in 23 fathoms 5 cables from the shore, but the bottom in this part is rocky.

There is also good anchorage in South bay, and that in its north-western part is better than the north-eastern. Here a vessel should anchor in about 8 fathoms, midway between Near island and the Zukur shore eastward of it, with the northern end of Near island bearing W.N.W. There are a few straggling huts on the shore, and some trees. Across the entrance of the bay, the soundings are from 30 to 36 fathoms, with an irregular decrease, there being 9 fathoms a short distance from the shore reef in the western bight, and 9, 13, and 15 fathoms in the eastern bight.

Indifferent water may be obtained about 1½ miles northward of the bay formed by Sandy Peak island, and probably elsewhere, by digging a hole in the sand. The Turkish garrison, however, obtain their water supply from Ras Zebid on the mainland coast opposite.

Wood may be obtained on the northern and southern parts of Jebel Zukur, and there is grass in some of the valleys, where antelopes are found. The island has no permanent inhabitants, but is resorted to by fishermen from Kamaran and Makalla in search of various Red sea productions, sharks' fins, salt fish, turtle, &c. The fishermen generally remain from February until May or June.

High island, 216 feet high, and having a flat appearance, lies North from the northern end of Jebel Zukur; from which it is separated by a navigable channel 5 cables wide and 19 fathoms deep. The island may be approached on all sides to the distance of a cable.

General charts 143, 8e, and 2523.

Plan on 453, Abu Ail channel. Var. 2° 20′ W.

ABU AIL ISLANDS (*Lat. 14° 5′ N., Long. 42° 49′ E.*), lie 3 miles eastward from North point, Jebel Zukur; Quoin island, the westernmost, on which stands the lighthouse, is 345 feet high, and from the northward makes as a pyramid; Pile island, the easternmost, is 287 feet high. They are of a whitish-brown colour, and therefore, before the installation of the light, were not so easily seen at night as islands of a darker shade; they have a bold and steep appearance, and are entirely destitute of vegetation.

Abu Ail Group, *from the Southward.*

Abu Ail Group *from the Northward.*

LIGHT.—From a red iron cylindrical tower, 65 feet high, with a white lantern and white keeper's house, on Quoin island and at 384 feet above high water, is exhibited a *group flashing white* light, with a *ten seconds* period, visible 25 miles where not masked by the high land of Jebel Zukur or the Hanish islands. The light shows thus:—a group of *two flashes* of *one tenth of a second each*, at intervals of *ten seconds* between each group.

Landing may be effected on the eastern side of Quoin island, but with difficulty. Pile island is an inaccessible pile of rock. On the south-western side of Quoin island, about 2½ cables distant, is a ledge of rocks 6 feet high with foul ground extending in an east-south-easterly direction for 2½ cables. The narrow channel between the rocks and Quoin island has a depth of 13 fathoms but should not attempted.

Abu Ail channel.—This channel, between Quoin island and Jebel Zukur, is more than 2 miles wide at the narrowest part, and the mid-channel depths are from 40 to 50 fathoms. Vessels from either direction should keep about a central course through the channel in order to avoid the rocks described lying south-westward of Quoin island and also East point, Jebel

Plan on 453, Abu Ali channel. Var. 2° 20′ W.

Zukur with a rocky patch of 2½ fathoms off it; bearing in mind that the tidal streams here are very irregular and occasionally set across the channel. It should also be specially noted that at night or in hazy weather the high land of Jebel Zukur often has a peculiar distant appearance, and East point, being low, with white sand behind, is then easily mistaken for water and is not seen until a vessel is dangerously close to it.

Plan on 453, Jebel Zukur and Hanish islands.

Tongue island, so called from its shape, is 166 feet high and more than 2 miles from the south-western end of Jebel Zukur, with a clear deep channel between them; it has on its southern side a low reef of rocks above water, the whole forming a circular basin about 3 cables in diameter. The depths in the basin are from 18 to 22 fathoms; boats can enter on the eastern side, through a passage having a depth of 10 feet.

LITTLE HANISH (*Lat. 13° 52′ N., Long. 12° 47′ E.*), about 1¾ miles southward of Jebel Zukur, and separated from it by a channel with from 30 to 40 fathoms water, is 627 feet high, 3 miles long, and 1¼ miles wide; it has a remarkable piece of land on the summit of the eastern end, which, when observed from Great Hanish, resembles a thumb or small peak in the act of falling, and is therefore named Tumble-down peak. The island is rugged, with grass in some parts, and a few antelopes are found on it.

Off the north-eastern side of Little Hanish, about a mile distant, are some rocky islets connected with that part of Little Hanish by sunken rocks; the northern islet is 88 feet high. Off the eastern coast is a chain of islets about 2 miles long, separated from Little Hanish by a navigable channel nearly 5 cables wide. Low island, the largest of the chain, is 48 feet high, and off its eastern side, nearly a cable from the shore is a rock 35 feet high; at 1½ cables outside this is Fawn rock nearly awash at low water.

A rocky 7-fathoms patch lies 2½ miles eastward from Tumble-down peak, and 1¼ miles from the nearest part of Low island. Although 7 fathoms was the least water found during the survey, it is possible, considering the nature of the ground, that shoaler water may exist. Vessels, therefore, should give Low island a wide berth.

Anchorage, in 16 fathoms, with good shelter from southerly winds, may be found in the channel between Little Hanish and Low island, with the southern part of Low island just open of its western point, and the little islet off its northern end bearing N.E. ½ E. Another berth, farther south-

Plan on 453, Jebel Zukur and Hanish islands. Var 2° 20′ W.

ward is in 17 fathoms, with the southern end of Low island bearing South, and the small islet off the northern end kept a little open.

GREAT HANISH.—(*North Point, Lat. 15° 47′ N., Long. 42° 47′ E.*), separated from Little Hanish by a channel nearly 3 miles wide with depths of from 30 to 45 fathoms, is 10 miles long north-east and south-west by an extreme width of about 3 miles. The highest part, 1,335 feet high, is near the centre, and, as seen from some directions, appears as a remarkable bluff. A strip of sand stretches across the island at 3 miles from the southern end, and the land on either side being high, the southern part, from a distance, has the appearance of being a separate island. The south-western end of the island is steep-to on its western side, having no bottom at 100 fathoms close inshore, in some places. There is a good deal of grass in the valleys and many antelopes.

Anchorages.—Along the eastern side of the islands, outside the fringing reef, the soundings are tolerably regular, affording anchorage and good shelter in northerly winds. One of these anchorages is near the northern end of the island, from 6 to 8 cables from the shore, in from 7 to 12 fathoms, with Haycock island just open of the north-eastern point of Great Hanish; another is nearer the shore in about 11 fathoms, with North Round island bearing about E. by N., and the Chor rock S. ¾ W.; but the best anchorage is farther southward, in 16 fathoms, with Double-peak island bearing about S.E. There is also anchorage in South-east bay, at the southern end of Great Hanish.

The following are the smaller islets and rocks lying near Great Hanish—they are nearly all eastward or southward of the island except the South-west rocks, and the dangerous Marescaux rock now to be described.

Marescaux rock.— This rock, with only 6 feet water, lies 1¼ miles from the nearest shore off the north-western side of Great Hanish. The rock is of small extent, and the sea generally breaks on it, but the ground in the neighbourhood has not been examined, and the locality should be avoided. From it the northern extremes of Peaky island, 107 feet high, and of Great Hanish, are just in line.

Haycock island, 519 feet high, is separated from the north-eastern point of Great Hanish by a narrow channel having general depths of 9 or 10 fathoms; but nearly in mid-channel, though nearest to the Haycock shore, is a sunken rock having only 6 feet over it. The island resembles a haycock from the southward, but on passing close eastward of it, the inside appears to be hollowed out like a saucer.

General charts 143, 8e, and 2523.

Plan on 453, Jebel Zukur and Hanish islands. Var. 2° 20′ W.

Currents run strongly round Haycock island, and a whirl or eddy is seen off the coast of Great Hanish southward of the Haycock. There are also tide rips between the Haycock and Mushéjera islet.

Addar Ail (*Lat. 13° 48′ N., Long. 42° 48′ E.*).—This small group of rocky islets, the highest being 120 feet, is nearly a mile distant from the eastern side of the Haycock, and in the channel between them the depth is about 28 fathoms; they form a circular basin 1½ cables in diameter, with a small opening on its southern edge.

Mushéjera, a small islet lying 2¾ miles eastward of the highest part of the Haycock, is about 24 feet high, and nearly a cable in length. On its southern and western sides it may be safely approached to a distance of 2 cables, but a dangerous reef extends 3 cables eastward and north-eastward from it, and the island, being low, is not easily seen at night. The passage between Mushéjera and Addar Ail is clear.

North Round island and Quoin island, 360 and 229 feet high respectively, and both named from their shape, are from 1¼ to 2 miles from the centre of the eastern side of Great Hanish, with a 20-fathoms channel between them and it. The channel between the two islands is also clear, and has a depth of 11 fathoms.

Chor rock.—At 2¾ miles S.W. by W. from North Round island, and 7 cables from the shore of Great Hanish, are some black rocks, of which the Chor rock is the highest, being 72 feet above water; these rocks have from 6 to 9 fathoms, rocky bottom, on their eastern side, and from 12 to 17 fathoms, 5 cables distant in the same direction, increasing to 24 fathoms between them and the Round islands, whilst between the Chor rock and the shore is a channel with from 7 to 9 fathoms.

Suyul-Hanish islands (*Lat. 13° 37′ N., Long. 42° 41′ E.*), three in number, and connected by a reef, together occupy a space nearly 3½ miles long on a north-north-east line of bearing, and their south-western end is about 3 miles from the south-eastern part of Great Hanish; their northern end is less than 1¾ miles from that island, between which and them is a navigable channel with the Pin and Cust rocks in the middle of its southern entrance, and the Chor rock in its northern entrance. The islands are of considerable height; Double-peak island, the northernmost, is 446 feet high and very steep, with two small peaks close together; Suyul-Hanish, the southernmost and largest, is 2 miles long, one mile wide at its

Plan on 453, Jebel Zukur and Hanish islands. Var. 2° 20′ W.

southern end, 381 feet high, and very rugged. Temporary anchorage may be found on its eastern side. Mid island, circular in shape and about 2 cables in diameter lies between the two islands.

Pin rock, 12 feet high, lies nearly midway between the southern points of Great Hanish and Suyul-Hanish.

Cust rock, a sunken rock, lies about 7 cables W.N.W. from Pin rock, and on the same bank. There is deep water between it and the Pin rock.

Ship and Three-foot rocks.—The Ship rock, a dangerous sunken rock with 6 feet water, lies S.W. by W. from the peak of Suyul-Hanish, and about 8½ cables from the nearest part of that island. The Three-foot rock, a small rock of fine vesicular lava standing 3 feet above the water, lies S.W. ¾ W. from Suyul-Hanish peak and 2½ miles from the nearest part of that island; it is 1⅔ miles outside Ship rock, and has deep water close to.

South Round island and Rocky islands.—Eastward of Double-peak island, 2¾ miles distant, is South Round island, 87 feet high and dark in appearance; and 1¾ miles south-westward of South Round island are the Rocky islands, consisting of black rugged rocks, the highest 55 feet above the sea.

Parkin rock (*Lat. 13° 38′ N., Long. 42° 48′ E.*), a small rock 11 feet high and nearly 2½ miles S. by E. from South Round island, is the south-eastern rock of the Hanish group. From it, Suyul-Hanish peak bears W. ⅓ S. 4¾ miles, and Quoin island peak North 5½ miles. Caution is necessary in the vicinity of this rock, as the soundings are very regular, from 24 to 27 fathoms, until close to the rock, thus giving little or no warning of approach to it.

South-west rocks, a small cluster 22 feet high, composed of volcanic tuff, lie 4½ miles westward from the south extreme of Great Hanish, and have deep water all round.

The Haycocks are three islets south-westward of the Hanish group, lying in a north-east and south-west direction; the north-eastern islet bearing S.W. by W. ½ W. 4 miles from the Three-foot rock just described.

The Middle Haycock (*Lat. 13° 32′ N., Long. 42° 36′ E.*) is a symmetrical and conspicuous cone, 310 feet high.

Chart 143, Jebel Teir to Perim.

MOHABBAKAH ISLANDS, a group of four islets southward of the Haycocks, are named respectively High, Flat, Harbi, and Sayal, islands. High island, the northernmost of

Chart 143, Jebel Teir to Perim. Var. 2° 20′ W.

the four and the nearest to the south-western Haycock, bears S.S.W. ½ W. 1¾ miles from that islet. High island is rather less than 2 cables long east and west, the eastern and highest end rising to a height of 69 feet.

Flat island (*Lat. 13° 25′ N., Long. 42° 33′ E.*), 2¾ miles south-westward from High island, rises vertically from the water to a height of 40 feet. It is perforated at its northern end, and the hole is large and conspicuous on certain bearings. The surface of the island is white and perfectly flat.

Harbi island, S.E. by E. 6½ miles from Flat island, is about 2 cables long north and south; it is a similar white rocky island to Flat island, and about 82 feet high at its southern end.

Sayal island is a small rocky island, 50 feet high, 6¾ miles north-north-east from the summit of Ras Beilul.

All the islands between Great Hanish and Ras Beilul are surrounded by deep water, the depth close alongside exceeding 10 fathoms, and rapidly increasing. They are all more or less covered with bird lime, which gives them the white appearance described, and at times makes them difficult to distinguish.

Harbi and Sayal islands are about 60 miles distant from Perim island in the straits of Bab-el-Mandeb, and, from these islands southward to the straits, all shoals and islets are included in the descriptions of the neighbouring shores of the Red Sea in the following chapters.

Charts 8a, b, c, and d, Red Sea.

WESTERN SHORE.—General Remarks.—The tract described in this chapter embraces the remainder of the Egyptian coast proper, and the whole of the coast of Nubia. At 40 miles southward of the Jifátin islands, the Nile approaches the Red Sea within less than 70 miles; it then increases its distance from it, and between lats. 22° 35′ and 19° 30′ N. makes a great bend to the westward. Between the Nile and the Red Sea, this vast tract of country forms the stony and sandy desert of Nubia. Mountains forming a continuation of the range traversing Egypt approach the coast now under consideration at various distances. In the northern portion and as far south as the remarkable Elba mountains, they border on the coast. The general height of the table-land of Nubia in the southern and highest part is about 4,000 feet, and between it and the coast, a low tract of sandy land intervenes. The shore is studded with reefs and amongst them are many good anchorages.

Inner channel.—Harbours in.—General Remarks.—Protected by the numerous reefs just mentioned, is an in-shore and smooth water channel very useful to small vessels. It

Charts 8a, b, c, and d, Red Sea.

may be said to commence at Ras Raweiya (*Lat. 21° 0′ N., Long. 37° 20′ E.*), and to end with the South Massawa channel (*Lat. 15° 15′ N., Long. 40° 10′ E.*). As far as Suákin the channel is generally from 1½ to 3 miles wide, except in the neighbourhood of Salaka, Dabadiba, and Ras Raweiya, where the limits are about half a mile. From Ras Raweiya to Salaka, the most intricate part of the channel, the depths are generally moderate, and again from Mersa Fejer to Mersa Kihai; in all other parts there is very deep water.

From a little southward of Suákin, the channel becomes wider, passing outside the extensive shoals in a bight of the coast commencing about 18 miles below Suákin, and here soundings may generally be obtained; but, except in the harbours on the coast there are few places where vessels would care to anchor, the bottom being generally rocky with great over-falls. In most of the anchorages northward of Suákin, it is advisable to moor; and in many places, in blowing weather, it may be prudent to lay out the stream anchor on or near the weather beach.

There are several entrances to this channel from seaward, of which one of the best, northward of Suakin, is off Port Sudan, formerly known as Mersa Sheikh Barud. Another is off Suákin, and there is a wide one northward of the Dahalak banks, as also several channels out to seaward over the Dahalak bank, described in the following chapter, northward of Entaentor island, but none southward of it, except through the southern entrance, known as the South Massawa channel, between Ras Andadda and the Dahalak island reefs.

The principal towns or harbours on the whole of this tract of coast are Koseir, Port Súdan, Suákin, and Nowarat, included in the present chapter, and Massawa in the next.

Winds and weather.—In the Inner channel on this shore, northerly winds, inclining to land and sea breezes, are prevalent all the year round; but, as in the parts farther southward, they are light and variable in August and September, when there are also frequent calms; southerly winds are by no means common. From August to October the weather is generally fine; from November to the end of March is the rainy season on this coast, the rains, however, being light compared with those of other countries. *See* remarks on these subjects in Chapter I. and Meteorological tables, pages 556–558.

8a, Red Sea, sheet I. Var. 2° 50′ W.

COAST.—Aspect.—South-eastward of Jebel Umm Delfa or Slope hill (*Lat. 26° 59′ N., Long. 33° 30′ E.*), 7,165 feet high, the mountains forming the main coasts range gradually decrease in height. They approach close to the shore in the

Chart 8a, Red Sea, sheet I. Var. 2° 50′ W.

neighbourhood of Safája island, and are from 2,000 to 4,000 feet high, having several well-defined peaks, which may be readily distinguished by the aid of the chart. From Safája to Koseir the hills are lower, and the conspicuous peaks more scattered.

Between these places the coast is low, rising gradually at about 5 or 6 miles inland to mountains about 2,000 feet high.

Southward of the Jifátin islands, and as far as Koseir, the coast has a general south-south-east direction and is moderately clear of dangers. Abreast of Safája island (*Lat. 26° 46′ N., Long. 34° 0′ E.*), are outlying reefs 5½ miles from the nearest land. From thence to the village and boat anchorage of Kúweh, the shore is safe to approach. Near this village, at 3¼ miles from the nearest land, are the Kúweh reefs. From Kúweh to Koseir the shore is lined by a narrow fringing reef in which occasional openings form good boat harbours.

Chart 2838, Straits of Jubal.

Saal Hashish island (*Lat. 27° 1′ N., Long. 33° 55′ E.*), 10 feet high and 10 miles south south-westward of Jifátin Sería, is about 300 yards in length and situated on the northern end of a reef which extends 1¼ miles southward of it. Abreast of the island, the coast forms the bay known as Mersa Abu Mokhadij, which Saal Hashish and its reef serve to protect. There is a 7-fathoms channel between the reef and the mainland, but the western edge of the island reef has several outlying rocks. There are no outlying dangers eastward of the island reef.

Anchorages.– The low eastern point of Mersa Abu Mokhadij is 1½ miles south-eastward of Dísh tal Kora-thaba; between it and Hashish island is a deep channel about 7 cables wide, leading into an anchorage in from 15 to 20 fathoms, mud; but, when the wind is from the northward, by steaming slowly up to the reef off the point, shallower water may be obtained. Close to the edge of the reef are some detached rocks.

Another anchorage is southward of Saal Hashish reef in from 6 to 10 fathoms, sand and coral, with Saal Hashish bearing N. by E. about 1¼ miles.

At 2½ miles southward of Saal Hashish is a small and well protected boat harbour, with deep water close up to the shore reef.

Plan 14, Harbours and Anchorages in the Red Sea.

RAS ABU SOMER (*Lat 26° 52′ N., Long. 34° 0′ E.*), 80 feet high, is a gravel-topped hill, slightly higher than the neighbouring coast line, from which it projects 2½ miles with a double prong, north-eastward and south-eastward of which the extremes are 4 miles apart; it is safe of approach. Between Abu Mokhadij and Abu Somer, the shore is fringed by a narrow

Plan 11, Harbours and Anchorages in the Red Sea. Var. 2° 50′ W.

reef, which has deep water close to, and, with the exception of the small patch, Sherm ah Naggah, has no outlying dangers. The shore reef extends half a mile south-eastward from Ras Abu Somer.

Coral island lies 7 cables south-westward from Ras Abu Somer, and is only 4 feet high; it is surrounded by a reef, on the southern end of which is a small sandy islet.

North-westward of Coral island, the shore reef, with a small islet on it, extends one mile from the land, leaving between it and Coral island a 4-fathoms channel 2½ cables wide. Between Coral island reef and Ras Abu Somer is a channel of the same depth but only 1¼ cables wide; at its entrance, near the edge of the reef projecting from Ras Abu Somer, are two coral rocks nearly awash.

Fairway reefs.—At the entrance of the channel between Safája and Coral island are the Fairway reefs. There are passages northward of, between, and southward of these reefs, but the northern channel is the best and the only one recommended.

Anchorage.—The best channel to the anchorage southward and westward of Ras Abu Somer is between Coral and Fairway reefs, passing southward of the sandy islet on the former; then taking care to avoid the mainland reef, haul up to the northward, westward of Coral island reef, and anchor in 7 fathoms with that island bearing South, and the south extreme of Ras Abu Somer E. by S. The least water in this channel is 4 fathoms, in the narrows north-westward of Coral island.

Anchorage with shelter from northerly winds may also be obtained in 8 fathoms, sand and coral, on a shelf extending 3 cables south-westward from Coral island.

SAFÁJA ISLAND (*Lat. 26° 46′ N., Long. 34° 0′ E.*), is 4¾ miles long north and south, and 1¾ miles wide at the northern part. The island is low and sandy; on its north-eastern extreme is a sandy-coloured table-hill 65 feet high. The eastern and western sides of Safája are fringed by a narrow reef, with deep water close to. Off the northern end, a reef with several outlying patches extends north-westward 1½ miles. The navigable channel between the island and the mainland narrows to a cable, and about one mile north-westward of the southern entrance is crossed by a bar with only 2 fathoms in the best water.

Outlying reefs.—From the table-hill, between the bearings E. by S. and S. by E., lie five dangerous coral reefs from 3½ to 6½ miles distant from the eastern side of Safája

Plan 14, Harbours and Anchorages in the Red Sea. Var. 2° 50′ W.

island; they are, Panorama reef, the northernmost; Middle reef, 2½ miles south-eastward of the first; Shab Shear, the south-easternmost; Hyndman reefs, 2 miles westward of Shab Shear, and covering a space about 2 miles long in a north-north-west direction by one mile wide; and Fellowes rocks, nearly 2 miles westward of Middle reef, a small patch, but with depths of from 4 to 7 fathoms for some distance southward of them. Between and immediately outside these reefs there is deep navigable water. The south-eastern part of Panorama reef bears E. by S. 4¾ miles from the table-hill of Safája.

Shab Shear.—The south-eastern extreme of this, the outer and south-easternmost reef, bears S.E. ½ S. 9¼ miles from the table-hill on Safája island, and is 5⅓ miles distant from Safája Ulbur, the nearest part of the mainland.

Spit reef.—At 4 miles southward of Safája island, the shore reef extends nearly 3 miles, from the mainland in a north-north-easterly direction, and is 1½ miles wide. One part of the reef, a sand patch nearly 2 miles long, uncovers at low water. There is deep water on all sides of the Spit reef, but it is prolonged from its northern end by very uneven depths of from 4 to 10 fathoms.

Cannon reef (*Lat. 26° 39′ N., Long. 34° E.*), 1½ miles farther south-eastward, is a prong stretching nearly 2 miles northward from the shore. There is as much as 30 fathoms between it and the Spit reef, and much deeper water between it and Hyndman reefs, about 2¼ miles eastward.

Directions.—Anchorage.—Safája island affords sheltered anchorage for vessels approaching the Strait of Jubal. There is good anchorage both northward and southward of it.

To enter the southern anchorage, steer W. ½ S. for Safája table-hill, passing northward of Panorama reef, until within a mile of the shore; then alter course to the southward, running along the edge of the reef, and haul to the north-westward round the southern point of Safája island. Off the latter, there are some detached rocks 3 cables from the point in a southerly direction. Anchor in from 6 to 9 fathoms, sand and coral, on a bank of soundings connecting the island with the Spit reef, with the southern point of the island bearing S.E. by E. ½ E. rather over a mile, and Safája table-hill about N.N.E.

There is deeper water, 12 to 18 fathoms nearer the point, where the anchor is placed on the plan, with good shelter.

Charts 8a and 8b, Red Sea, sheets I. and II.

Aspect.—Jebel Umm Kabash, 2,235 feet high, rises close to the coast and marks the position of Safája island and reefs. It is readily distinguished, being at the southern end of the

Charts 8a and 8b, Red Sea, sheets I. and II. Var. 2° 40′ W.

lofty main range. The most conspicuous of the neighbouring hills is Jebel Umm Betelshade, a sharp peak 1,980 feet high, 11 miles south-westward from Safája, and 7 miles from the nearest point of the coast.

Jebel Kúweh (*Lat. 26° 18′ N., Long. 34° 3′ E.*) is 6½ miles inland, and is a prominent sugar-loaf peak, 1,600 feet high. It lies southward of the Arab encampment of Kúweh charted abreast the Kúweh reefs.

Kúweh reefs.—From 2 to 3¼ miles in an east-north-east direction from Kúweh village are several dangerous reefs, with deep water between them and the shore. From their southern extreme, Kuweh bears S.W. by W. ½ W.

Anchorage.—Temporary anchorage may be obtained under the southern side of the innermost of the Kúweh reefs in about 6 fathoms.

Boat harbours and landing place.—At high water, there is an opening in the reef 5 cables southward of Kúweh village, through which a boat can approach the shore; but the best landing-place is about a mile southward of the village, where there is a good boat harbour. About 6 miles southward of Kúweh is another boat harbour; Jebel Kúweh bearing W. by N. leads directly to it.

Plan of Koseir anchorage on chart 8b, Red Sea, sheet II. Var. 2° 30′ W.

KOSEIR (*Lat. 26° 6′ N., Long. 34° 17′ E.*).—The town of Koseir, containing about 3,000 inhabitants, is built on a low sandy point projecting a little from the line of coast, and forming a bight, in which coasters find good holding-ground and good shelter from northerly winds, whilst south-easterly winds are said not to blow home; but there is no harbour. An old Turkish fort occupies the higher ground, westward of the town. The houses of Koseir are built either of stone, sandstone, or chalk, obtained from the neighbouring hills; the streets are clean, regular, and at short intervals run at right angles to each other. These, however, are but the remains of former prosperity, for when the railroad from Cairo to Suez was completed and steam-vessels began to run regularly from the latter port to Jidda and Suákin, trade, with the exception of grain, almost entirely left Koseir. The distance to Keneh, the nearest point of the Nile is 120 miles.

Koseir is a coastguard station.

Appearance of the Land about Koseir, town N. 70° W. about 7 m.

General charts 8b and 2523.

Plan of Koseir anchorage on Chart 8b, Red Sea, sheet II. Var. 2° 40′ W.

Water is condensed at Koseir at the rate of 30 tons a day; the tank will hold 200 tons, and 50 tons is or was the minimum stock. The price in 1894 was 13*s.* 6*d.* per ton, but is probably less now. Near the condenser is a pier, with 5 feet at the outer end at high water. No supplies can be obtained at Koseir. Fresh water for use in the town is brought from wells several miles inland.

Tides.—It is high water, full and change, at Koseir, at 6h.; the rise is 3 feet at springs.

Anchorages.—Besides the anchorage for small craft only, close in to the town, there is indifferent anchorage on a bank one mile in extent with from 15 to 17 fathoms, sand and coral, situated 1½ miles eastward from the fort. Between this bank and the point of the coast reef are depths of 45 fathoms.

There is also anchorage in 15 fathoms close off the point of the coast reef, which extends seaward about 3 cables from the town, by a beacon; a buoy in 3 fathoms, lies 3 cables south-east of the beacon.

There is no sheltered anchorage anywhere between Safája island and Koseir.

Directions.—For 8 or 9 miles northward and southward of Koseir, the coast is very low, and a long line of hills from 700 to 1,000 feet high, 5 or 6 miles inland, presents no prominent mark to guide a ship towards the port, especially at night; there is, however, one conspicuous cone-shaped summit, visible as far distant as the Brothers islets, which, kept bearing S. 76° W. leads direct to the anchorage. The small fort westward of the town can be seen from sea when 10 or 12 miles distant in clear weather.

Jebel Abu Tiyur (*Lat.* 25° 12′ *N.*, *Long.* 34° 11′ *E.*), 4,500 feet high is the most conspicuous and highest mountain on this part of the coast; its north-western brow is the highest, and from Koseir anchorage bears S. by W. ½ W. 21 miles. From the northward, this mountain shows in peaks. From east-north-east it appears flattened; and from the south-westward the northern summits become rounded and the southern summits gradually appear as peaks. Being so far inland, Jebel Abu Tiyur can seldom be seen from a vessel at night.

In making Koseir, a sailing vessel not certain of her latitude, should make the Brothers islets, and, if north-westerly winds are blowing, should stand in for the coast 7 or 8 miles northward of the port, and then bear up close along shore. Sailing vessels cannot be too careful not to get southward of

Plan, Koseir anchorage, on chart 8b, Red Sea, sheet II. Var. 2° 40′ W.

the port; for a vessel making the land a few miles too far southward, has often taken three or four days to beat back, the north-westerly winds causing a continuous drain of current and heavy swell along, and even some distance from, the shore. In such a case, a sailing vessel had better stand over to the Arabian side and make her northing there, rather than make short tacks on the Egyptian side. A vessel making the port at night and not intending to anchor, should not heave to, but stand off and on, or she will drift to leeward.

Chart 8b, Red Sea, sheet II.

COAST.—From Koseir, the coast trends in a general south-south-easterly direction 155 miles to Ras Benas, receding 10 miles from this line at Sherm Sheikh, about 100 miles southward of Koseir.

Ras Abu Hajar (*Lat. 25° 58′ N., Long. 34° 25′ E.*).—**Reef.**—This Ras or point lies 10 miles southward from the town of Koseir. Off the Ras is a reef, with one or more heads, the outer of which is about 1½ miles distant from the shore. It has estimated depths of from one to 3 fathoms, and an apparent extent of about one mile in a south-south-east and opposite direction, and a width of about 3 cables. From it, Ras Abu Hajar bears about S.W. ½ W. Jebel es Selle, a black hill shaped like a cone and standing among a number of low sandhills about 3 miles inland, is nearly in the same line.

Mersa Toronbi.—At 28 miles south-eastward from Koseir is this anchorage in 7 or 8 fathoms, a little sheltered from north-westerly winds by a low point of the mainland. Northward of the point are two small shoals close inshore, with from 17 to 20 fathoms near them, as well as for 3 miles eastward and north-eastward of them.

Cats' Ears (*Lat. 25° 39′ N., Long. 34° 30′ E.*).—W. by S. 12 miles from Mers Toronbi, is the Cats' Ears hill, with three round well-defined heads. The range extends south-westward and rises in height near Cap hill. *See* view on chart, 8*b*.

Ras Hamrhu is a bluff red cape 10 miles southward of Mersa Toronbi. The shore in this vicinity is steep-to.

Mersa ma Mubárak (*Lat. 25° 30′ N., Long. 34° 38′ E.*), 4 miles south-eastward of Ras Hamrhu, is a good anchorage in a small bay between two reefs, with 6 and 7 fathoms water inside. Midway between Ras Hamrhu and Mersa Ma Mubárak is charted Mubárak inlet receding upwards of a mile inland, but of which nothing is known.

General chart 2523.

Plan 3047, Mersa Dhiba. Var. 2° 40′ W.

MERSA DHIBA. (*Lat. 25° 20′ N., Long. 34° 44′ E.*), is a cove, about 2 cables wide, in the tolerably level sandy shore; it must be approached from the northward on account of the danger mentioned below, keeping a safe distance from the shore reef; it affords good anchorage in 16 fathoms in westerly winds. Westward of Mersa Dhiba, about 15 miles inland, is Jebel Rosas, of unknown height, but a single and prominent peak, with many shoulders.

Reefs. Extending 3 miles from the shore just southward of Mersa Dhiba, and then turning nearly 5 miles to the northward, is a large space of dangerous ground with many rocks and shoals, having from 10 to 14 fathoms between and amongst them.

Chart 8b, Red Sea, Sheet II.

Elphinstone Reef (*Lat. 25° 19′ N., Long. 34° 50′ E.*), 6 miles E. by S. ½ S. from Mersa Dhiba, and has deep water all around; but, between it and Mersa Dhiba are the dangerous shoals and rocks just mentioned.

COAST.—Ras Egela, 5½ miles south-eastward from Mersa Dhiba, is a light-brown double hill, forming a fairly good landmark.

Mersa Zebara (*Lat. 25° 11′ N., Long. 34° 18′ E.*).—Anchorage will be found in this small narrow cove; the entrance is not more than 100 yards wide but it is perfectly sheltered.

Reef.—Anchorage.—In lat. 25° 4′ N. there is a reef 2½ miles from the shore, on the southern extreme of which a vessel may anchor in from 10 to 18 fathoms, well sheltered from north-westerly winds. The northern part of the reef has rocks nearly awash.

Mersa Tundeba is an anchorage in 10 fathoms, close inshore, where a vessel may lie under shelter of a low point with small reef projecting from it nearly 2 miles southward of Ras Somadi.

Reef.—Anchorage.—E. by N. ½ N. 3¾ miles from the above anchorage is a small reef with anchorage on its southward of it. This reef is at the northern extreme of a bank of soundings about a mile in extent, surrounded by deep water. A dangerous rock lies 1½ miles south-westward from its southern extreme in the direction of Ras Dhurra.

South-westward of Mersa Tundeba rises Jebel Zebara, a little above the mountain range. On this hill are remains of ancient structures, emerald and beryl mines, and abandoned quarries.

General charts 8b and 2523.

Chart 8b, Red Sea, Sheet II. Var. 2° 40′ W.

Wadi Nukeri, just northward of Ras Dhurra, has a small boat harbour. On the low hillocks near the shore are two great rectangular blocks, the site of the ancient town of Nechesias. The adjacent country is barren, and inhabited by the Abahdel tribe.

Ras Dhurra is a low point of the mainland with a long reef extending parallel with and close to it. There are several detached reefs, steep-to, and extending nearly 6 miles off shore, between Ras Dhurra and Ras Uriah, some 10 miles to the southward (as shown on the charts), dangerous to navigation.

WADI JEMAL ISLAND (*Lat. 24° 40′ N., Long. 35° 9′ E.*), is a low rocky island 2½ miles long north-west and south-east. The coral reef Shab Ghadera extends 4 miles off its northern end. The channel between the island and the main is encumbered with small reefs and is only available for small craft with local knowledge.

Anchorage.—Extending off the southern point of Wadi Jemal island is a bank on which a vessel may anchor in 8 or 10 fathoms, sand and rock, with the centre of the island bearing about North.

Dangers.—At 4½ miles eastward from Wadi Jemal island is a sunken rock, and others about the same distance north-eastward of the Shab Ghadira. These outer shoals have deep water close around them, and are a continuation of those referred to with Ras Dhurra.

CAUTION.—When within 10 miles of the land, the shore about this part ought to be approached with great caution.

Plan 3047, Sherm Sheikh.

SHERM SHEIKH (*Lat. 24° 37′ N., Long. 35° 7′ E.*).—About 4 miles south-westward of the southern point of Wadi Jemal island, is a cove in the mainland, the entrance to which is through an opening in the coast fringing coral reef about half a cable wide; it affords good anchorage in 8 fathoms. The head of the bay is shallow and the shore is flat and sandy, but at about one mile inland a chain of hills trends parallel with the shore, rising to a height of 492 feet, on which, at about half their height, is a great white patch under a table-topped hill, forming an excellent mark or recognition from the direction of Wadi Jemal. Wood can be procured here close to the anchorage.

Chart 8b, Red Sea, Sheet II.

Ras Umm-ul-Abbas is a low point, southward of which is an indifferent anchorage in 10 fathoms close to the shore

Chart 8b, Red Sea, Sheet II. Var. 2° 40′ W.

and affording good shelter from north-westerly winds. It lies about 6 miles southward from Wadi Jemal, and may be known by a remarkable sugar-loaf hill 300 or 400 feet high, close to the beach.

Small reef (*Lat. 24° 29′ N., Long. 35° 17′ E.*), with several shallow spots, is 4 miles in length by 2 miles in breadth, with its centre 5 miles from the shore; on the southern side are shallow spots about 3 miles from the northern extreme of the Gulhan island reefs; there are overfalls between the patches of rocks on the reef.

GULHAN ISLANDS.—Mehabis or South island (*Lat. 24° 19′ S., Long. 35° 22′ E.*), is the southernmost of this group of four low sandy islands, lying near the mainland and forming a chain nearly 5 miles long in a general north and south direction. Mehabis island is about one mile distant from the mainland at Ras Gulhan, with which it is almost connected by a large reef. Siyul or North island is the northernmost of the group, and reefs extend fully 3 miles north-north-westward from it. The other two islands lie between these two, but eastward of a line joining them; the northernmost of these is named Showarit or Grove island.

Reef.—The Gulhan islands are surrounded by extensive reefs, between which are narrow passages studded with rocks. Along the outer or eastern edge of the reefs, there is no bottom at 30 fathoms at a short distance from the rocks.

There are two small reefs south-eastward of Mehabis island and about a mile distant from it; also two small patches about 3 miles eastward of it and many others, as charted.

Anchorage.—Southward of the Mehabis islands, a vessel may anchor in 8 or 10 fathoms.

Jebel Hamata or Jebel Wadi Lehama, 22 miles west-south-westward from Gulhan group, is about 6,300 feet high and a remarkable mountain, whose peak is sometimes visible in clear weather 90 or 100 miles distant, and is frequently seen by vessels passing up the centre of the Red sea; *see* view on chart 8*b*.

Mersa Wadi Lehama, about 8 miles southward of Gulhan islands and 24 miles north-westward of Ras Benas, is a good anchorage in 7 or 8 fathoms under the lee of a low point, off which a narrow reef projects southward; the anchorage is between the point of the reef and the shore.

OFF-LYING REEFS.—E. by N. ½ N. from Mersa Wadi Lehama and from 6 to 9 miles distant, is a chain of small reefs

Chart 8b, Red Sea, Sheet II. Var. 2° 40′ W.

with no soundings shown close to them; and 9 or 10 miles to the north-eastward is another cluster, with numerous detached rocks between them. These rocks are all part of the scattered group of which Fury shoal is the south-eastern extreme.

Fury shoal (*Lat. 24° 10′ N., Long. 35° 40′ E.*).—At 13 miles N.N.W. from Ras Benas, and 7 miles off-shore, is this shoal, about 2 miles in extent with shallow headsand, with several detached reefs on its north-western side, the outer part of the shoal being distant from the shore 8 miles.

There is indifferent anchorage in 6 or 7 fathoms, rock, on the southern part of the Fury shoal, but it is very bad holding-ground and difficult to approach, the vicinity being studded with small rocks.

Between Mersa Wadi Lehama and Reef point, 9 miles south-eastward and about 8 miles from the former, lying parallel with and very near the shore, is a reef about one mile long by 2 cables wide.

Reef point, about 6 miles north-westward from Ras Benas, has off it several small reefs, the nearest little more than a mile from the point; two of these reefs show above water, one is about 2½ miles northward of Reef point, the other, 4 miles eastward of it and about 1½ miles from the shore, on the parallel of 24° N. The land near Reef point forms a bay with very deep water, there being no soundings near the shore.

RAS BENAS (*Lat. 23° 57′ N., Long. 35° 47′ E.*).—This point, marked by a conspicuous tomb, is the eastern extreme of a promontory about 6 miles wide at its base, from which it projects about 16 miles in an east-south-east direction to the point, and from thence again a narrow tongue extends southward 4 miles toward Mukawar island. On the western or inner side of the point, an extensive reef runs off westward and southward, almost to the parallel of Mukawar island, its southern edge bearing W.N.W. from the south extreme of that island; off the extreme point of the reef are numerous small reefs and rocks, with irregular soundings between them of from 8 to 30 fathoms. The channel between Ras Benas reef and Mukawar island is 1½ miles wide.

Jezira ridge.—On the promontory, from 5 to 12 miles in rear of the point are some moderately high hills known as the Jezira ridge; they slope down to the low sandy ground which terminates in the point and its southern tongue, off the eastern face of the point, there is no bottom at 30 fathoms close inshore.

General chart 2523.

Chart 8b, Red Sea, Sheet II. Var. 2° 40′ W.

Cygnet rock (*Lat. 23° 54′ N., Long. 35° 39′ E.*).—This rock, discovered by H.M.S. *Cygnet* in 1886, is a small coral shoal only a few yards in circumference, and has, apparently less than 6 feet over it, and very irregular depths in the vicinity. It is charted about one mile from the shore and 3 miles westward of the shore reef of Ras Benas, just described; its position, however, as charted, is only approximately correct, and when the locality was again examined by H.M.S. *Scout* in 1902, depths of from 9 to 21 fathoms were found from 4 to 5 miles south-eastward of Philadelphus point, the bottom being plainly visible in places. A cast of 11 fathoms was also obtained 1½ miles south-westward of the Cygnet rock; between this position and the charted position of that rock, patches of discoloured water were visible.

When the Bodkin (*Lat. 23° 30′ N., Long. 35° 20′ E.*), a remarkable sharp peak 4,036 feet high, in the mountains of Berenice, to the south-westward begins to close in with the double-topped mountains southward of the highest peak of this range, a sharp look-out should be kept for the Cygnet rock, on which the sea does not break.

Mukawar or Emerald island (*Lat. 23° 50′ N., Long. 35° 48′ E.*), distant nearly 3 miles S. by E. from the southern low sandy point of Ras Benas, is a mile in length and about 100 feet high at its southern end; when viewed on a south-westerly bearing, it has the appearance of an inclined plane. The island is a mass of coral and affords no anchorage, there being very deep water close to the coral reef by which it is fringed on all sides, and which, off the north-western end, extends 5 cables from the island.

ANCHORAGES.—There is anchorage for small craft in 12 fathoms on the western slope of Ras Benas reef, with the south extreme of the point bearing S.E. about 3¾ miles.

H.M.S. *Cygnet* reported, in 1886, that it seemed somewhat dangerous to attempt reaching the anchorage here described, discoloured water appearing to surround it. She anchored a little farther westward, on a small patch in 12 fathoms, half a mile from the shore, with Mukawar island bearing S.E. about 7 miles. With 5½ shackles of cable out, the ship swung into 23 fathoms, but the anchor held well though the wind was off-shore, and the force from 5 to 7.

A good look out from aloft is necessary when approaching this or similar anchorages.

Horse-shoe reef.—There is anchorage for small craft on the south-western side of the Horse-shoe reef, which reef is situated about 1½ miles south-south-west from Mukawar island, is about 3 miles long north-west and south-east, and is on the

Chart 8b, Red Sea, Sheet II. Var. 2° 40′ W.

north-eastern edge of a nearly circular bank of soundings 2 miles in diameter with depths under 20 fathoms; the southern edge of the reef is awash and steep-to.

White rock.—Indifferent anchorage for small craft may also be found on the reef on which is White rock, shaped like a boat and 7 miles south-westward from the centre of the Horse-shoe reef. Another similar anchorage is afforded by a shoal and rocky bank lying south-south-eastward of White rock in lat. 23° 34′ N.; this, however, must be approached with caution for H.M.S. *Dolphin* grounded here in 1894 on a coral pinnacle.

Fairly good anchorage for small craft may be found southward of a horse-shoe-shaped reef about 8 cables in extent east and west, and charted in lat. 23° 28′ N., long. 35° 44′ E., but from bearings of St John's island and Bodkin peak, taken by the officers of the *Scout*, it would appear to be about 2 miles southward of the position assigned. Shoal patches were observed to extend about 2½ cables from its southern side.

ST. JOHN'S or ZEBERJED ISLAND (*Lat. 23° 36′ N., Long. 36° 10′ E.*), is circular, about 1½ miles in diameter and 700 feet high; the hill in the centre is a remarkable sharp peak of volcanic origin. St. John's was formerly famous for its emeralds. Turtle are numerous hereabouts and valuable for their shell. The island is barren and affords neither water nor vegetable produce, but it is occasionally visited by fishermen during the turtle season. It is steep-to on all sides, having no soundings near the fringe of coral reef, about 2 cables wide, which surrounds it or rather, forms its base, and often renders the island inaccessible.

Rocky island.—About 3 miles south-eastward of St John's is this small steep rocky island, with no soundings charted near it.

St. John's reef lies S.W. ⅛ W. 14 miles from the peak of the island; many others lie westward and south-westward of this outer reef, but none south-eastward of the latter direction. A line drawn direct from St John's reef to Ras Benas passes eastward of all other reefs in its immediate vicinity, and 3 or 4 miles outside the outer reefs in the northern part of Foul bay.

There are reefs charted about here and eastward of St. John's reef which are too numerous to describe.

Plan 3289. Port Berenice.

PORT BERENICE.—(*Lat. 23° 56′ N., Long. 35° 29′ E.*). —About 16 miles westward from the low southern point of Ras Benas, and 12 miles from the anchorage just described in Ras

Plan 3289, Port Berenice. Var. 2° 40′ W.

Benas bay, is the entrance to this port, formed in the north-western angle of the deep bight sheltered by the promontory of Ras Benas. The port is protected on the eastern side by a long sand-spit with low hillocks and bushes on it. From the southward, it is protected by the reefs of Foul bay below mentioned.

On the western shore, near the anchorage, are some Egyptian ruins nearly covered with sand, the remains of the ancient city of Berenice, now by no means conspicuous from the sea, but formerly a place of considerable importance. The small bays or coves which gave shelter to the traders of ancient Berenice are entirely closed by sand, except North cove, the northern one, which is about $1\frac{1}{3}$ cables wide between the shoals in the entrance, and affords anchorage in 7 fathoms over sand coral bottoms.

The landing-place for the ruins will be recognised by two hillocks about 30 feet high, which rise close to the sea at the termination of a low conspicuous point of dark-coloured rocks about 15 feet high. There is also a convenient landing place on the north-western side of North cove.

Shoals.—A 2-fathoms shoal of small extent lies S. $\frac{3}{4}$ W. $1\frac{1}{2}$ miles from the south-western extreme of the sand-spit. At $2\frac{3}{4}$ miles eastward of it is a patch of 4 fathoms. These shoals are on the north side of a reef that extends some 8 miles eastward of port Berenice, thence trending southward, fronting the shore of Foul bay, as charted.

The seaward side of the sand-spit is bordered by shoal water extending 5 cables from it.

Anchorages.—North cove.—On the western side of the sandspit is extensive anchorage ground in about 14 fathoms, mud, sand, and coral; but here, owing to the strong northerly winds so prevalent during the day, there is often a very troublesome sea for boats.

At the head of the port are two coves, approached by a narrow channel with a least depth of 6 fathoms, between the sandspit inner reef and some 3-fathoms patches. The best anchorage is in about 7 fathoms, at the mouth of North cove; here the water is always smooth with the prevailing wind.

The entrance to, and the Inner harbour, which has not been surveyed, and is said to be much encumbered with shoals, is eastward of the anchorage just given; the entrance is an intricate and narrow passage only available for light and handy craft.

The shores of the port, generally, consist of a low sandy plain, rising gently to the hills 5 or 6 miles distant, and dotted here and there by hillocks of drift sand. When surveyed in the summer of 1884, dry beds of mountain torrents were

Plan 3289, Port Berenice. Var. 2° 40′ W.

observed but no water or wells near the shore, nor at ancient Berenice. There are wells, however, at the villages at the foot of the hills, and fishermen obtain water at a place about 5 miles southward of the port.

Supplies.—A few sheep and fish were occasionally obtained at the time of the survey here, but there was no village nor any permanent population, the supply depending entirely on the chance of finding a few wandering fishermen plying their trade.

Climate.—In August 1884, the officers of H.M.S. *Myrmidon* reported the air to be fresh and cool. The wind generally blew hard from about north-north-west from 9h. a.m. to about 5h. p.m., but fell light during the night.

Plan 3,289, Port Berenice and chart 8b, Red Sea, Sheet II.

Directions.—In approaching port Berenice, either of the two channels south-westward of Mukawar is better than that northward of the island, whilst the South passage between the White rock reef and the shore reef should be entirely avoided, both the approach to it and the channel itself being encumbered with dangerous reefs as a glance at the chart will show. If the channel between Mukawar and the Horse-shoe reef is taken, care is required, after passing the island, not to bring its southern cliff southward of E. by S. ½ S. until at least 5 miles of westing has been made, in order to clear the south-western extreme of Ras Benas shore reef. The *Scout* took this route in 1901, and found the fringing reef of Mukawar and the Horse-shoe reef both well marked by discoloured water, but nothing was seen of the foul ground south-westward of Ras Benas nor any indication of the Cygnet rock, although the sun was in a good position.

If passing southward of the Horse-shoe reef, which being awash and steep-to at its southern end, is easily seen, make one mile of westing.

In either case, after sufficient westing is made, steer for Philadelphus point, a yellow cliffy point under a remarkable double summit, carefully avoiding the position assigned to the Cygnet rock. Approach the point to half a mile, and then alter course to West for the end of the sandspit, which, when within 5 miles, generally shows well up against the dark mountains in the background. Give the spit a berth of 3 cables in rounding, and anchor in about 14 fathoms, with the spit end bearing E. by S. about half a mile.

If proceeding to the anchorage in North cove, vessels should keep over towards the main reef on the starboard hand, the shoalest parts of which show when the sun is high

Chart 8b, Red Sea, Sheet II. Var. 2° 40′ W.

enough, in order to clear the 3-fathoms patches westward of the fairway. Vessels of more than 16 feet draught might find it advisable to buoy these patches before attempting the passage.

COAST.—Aspect.—From Port Berenice, the coast to the southward continues low, rocky, and intersected by several lagoons having their entrances blocked by sand. About 7 miles inland are the Berenice mountains, a narrow range attaining an extreme height of 4,440 feet. A plain drift of sand extends from their base to the sea, and they are broken into many varieties of shape, mostly terminating in sharp rugged points. One of the highest, so narrow that it bears some resemblance to a column, is the Bodkin (*Lat. 23° 30′ N., Long. 35° 20° E.*), before referred to; its remarkable appearance makes it easy of recognition and a useful landmark. There are no uplands in the vicinity equal in height or similar in appearance to this range.

Southward of the Berenice range, there is nothing in the low rocky coast peculiar or striking until approaching the mountain masses of Jebel Elba, about 8,000 feet high, whose peaks are seldom free from clouds. In clear weather, they can always be seen by vessels passing through the middle of the Red sea.

FOUL BAY, the northern arm of which is Port Berenice just described, is encumbered with reefs and sunken rocks. The rock on Shab Abu Fendera bearing southward of S.E. and the south-eastern extreme of St. John's island northward of N.E., leads eastward and south-eastward of the outer reefs.

The shores also throughout this bay are studded with reefs, and Lieut. Wellsted, Indian Navy, after a general examination of the district, reported this bay to be "encumbered with such a labyrinth of reefs, that our knowledge of them can serve no other purpose than to warn vessels from invading its limits." Nevertheless, the examination of these parts by H.M.S. *Scout* revealed many good anchorages, as presently described. It is possible that many anchorages will be found when accurately surveyed.

Plan on chart 8b, Scout anchorage.

Scout anchorage (*Lat. 23° 26′ N., Long. 35° 32′ E.*).—This anchorage was discovered by H.M.S. *Scout* in 1902 and is in the southern part of Foul bay, about 31 miles southward of the entrance to Port Berenice and just southward of the valley which divides into two sections the mountains of Berenice.

Plan on chart 8b, Scout anchorage. Var. 2° 40′ W.

Here the Bodkin reef, about 3 cables long west-north-west-and east-south-east and very narrow, offers good protection from northerly winds in about 10 fathoms, sand, coral and shells, at about 2 cables south-south-west from its eastern extreme, and 2 miles off-shore, with Bodkin peak bearing N 75° W. 11 miles distant.

The western half of the Bodkin reef has many detached rocky heads and foul ground westward of it.

Chart 8b, Red Sea, Sheet II.

Mirear (*Lat. 23° 11′ N., Long. 35° 44′ E.*) is a low sandy islet nearly central amongst a labyrinth of reefs extending in a north-westerly and south-easterly direction for about 25 miles; it is also about 7 miles off shore and 5 miles within the outer edge of these reefs.

Near the eastern side of this cluster is a reef about 10 miles long, under which there is anchorage, south-eastward of Mírear. There is also good anchorage about 5 miles northward of Mírear, on the south-western side of a cluster of reefs.

Mersa Shab, the entrance of which is in lat. 22° 51′ N., is an extensive inlet almost blocked up by the coast reef and inaccessible to ships. Close to the entrance, on the southern side, are two small islets on the fringing reef; outside the harbour or lagoon, indifferent anchorage for a small vessel may be found. The extremes of the reefs off Mersa Shab, as shown on the charts, must be considered as only approximately correct. A black conical hill about 8 miles inland on with a single tree close to the beach bearing S.W. leads through the wide gap between the outer reefs, but the position of these reefs is only approximate.

The *Scout* stood in on this line; it took her only 2 or 3 cables southward of the southern detached reef of the Mírear group, which broke occasionally, as did also the reef about 2½ miles westward of it. She must also have passed within 1½ miles of the outer charted rock southward of her course, but nothing was seen of this nor of any reefs on that side of the course though the conditions as to light, &c. were favourable.

Abu Dara.—From Mersa Shab to Abu Dara, a low point covered with bushes, the shore is fringed by reef, and fronted by numerous reefs, on which are the Siyal islands, extending from 12 to 18 miles from the shore, and 8 miles north-westward of Shab Abu Fendera.

SHAB ABU FENDERA (*East extreme, Lat. 22° 54′ N., Long. 35° 18′ E.*).—At about 42 miles southward of St. John's island, and N.E. ¾ N. 8 miles from the eastern extreme of the largest Siyal island, is the eastern and outer extreme of this

Chart 8b., Red Sea, Sheet II. Var. 2° 40′ W.

reef, which is 4 miles long east and west and is the outer reef off this part of the coast, it being distant 17 miles from Abu Dara, the nearest part of the mainland. There is a small rock about 20 feet high at its eastern extreme. There is anchorage in from 10 to 20 fathoms on the southern side of the reef, but the bottom is studded with numerous patches of rock.

Siyal islands, three in number, are about 8 feet above high water level, occupy a space about 6 miles long east and west, are composed of sand, and partly covered with bushes. They are between 7 and 9 miles north-eastward from the low bushy point of Abu Dara, the nearest part of the coast, and surrounded by numerous rocks and reefs, the whole space between them and the shore being occupied by reefs with such intricate passages among them that their navigation is practically barred, and should not be attempted except by boats. In 1884, Commander Carpenter, H.M.S. *Myrmidon*, passed between the Siyal Islands and Abu Dara. He says:—"I "conceived there was a passage with care through the reefs off "Abu Dara, but soon found myself in a network of shoals and "reefs from which it seemed there was no outlet. After *two* "*days'* careful guiding from aloft, with a boat ahead, and with "most favourable weather, I got through, the shoalest water "passed over being 21 feet."

The eastern Siyal island (*East extreme, Lat. 22° 48′ N., Long. 36° 13′ E.*), is the largest, being about 2 miles long east and west; it is seen at times from the large reef of Abu Fendera. These islands are the resort of numerous fishermen of the Huteimi tribe.

Chart 8c., Red Sea, Sheet III.

COAST.—From Abu Dara, the coast trends south-eastward 34 miles to Ras Jazriyal, and to seaward is studded with many rocks and several small low islets.

Elba island (*Lat. 22° 24′ N., Long. 36° 29′ E.*), a small low coral island 5 miles off-shore and 28 miles south-eastward from Siyal island, is on the body of the extensive reefs by which it is surrounded. Anchorage may be found on some spots or breaks in this reef, but sunken rocks are numerous about it.

Sherm Aluéda is an anchorage formed by the shore reef, 1½ miles south-eastward of Ras Abu Fatima and 6 miles westward of Elba island; the entrance to it is very narrow and the shelter excellent, but it is available for nothing larger than dhows.

Ras Jazr iyal is a coral cliff of moderate height 10 miles south-eastward from Elba island. Two islands lie north-east of it, with outlying reefs beyond, separated

Plan 14, Mersa Halaib. Var. 2° 40′ W.

from the mainland by a narrow channel which has not been surveyed. The eastern portion of this channel is Mersa Halaib.

MERSA HALAIB (*Fort, Lat. 22° 13′ N., Long. 36° 40′ E.*) is an excellent harbour with two anchorages north and south. For sailing vessels, it is difficult of access during north-westerly winds, the entrance channel, which, however, is deep, running north and south, but steam vessels will experience no difficulty. The position of the Fort as above stated is about 3 miles E.S.E. of the position assigned it on Chart 8c.

The harbour is formed by the reef extending 5½ cables southward from Sea point, which has a rock 2 feet high on the northern side of a small indentation at its outer edge, and several sandy islets and rocks some just awash, others above water in line between the point and the southern extreme of the reef; and by a long barrier reef extending from the southern shore 2½ miles from Sea point, then trending 2½ miles in a north-west direction, and terminating in North-west rock on the west side of the entrance.

Entrance.—The shoal extending from Sea point overlaps the barrier reef, leaving an entrance channel eastward of the reef about one cable wide, with from 7 to 13 fathoms.

A 5-fathoms patch lies one cable N.W. ½ N. from North-west rock, western side of the fairway, one of 3 fathoms (possibly less), 1½ cables North from it, and another of 4½ fathoms 2 cables N. ½ E. from the same rock. There is a canoe channel to the north-westward between the mainland and the islands. There is an intricate boat passage through the barrier reef, about 1½ miles south-eastward of the town.

Within the entrance, the harbour opens out into two good anchorages northward and southward of the entrance, with depths of from about 14 to 5 fathoms. The shores of the harbour are fringed with reefs from 2 to 3 cables wide, with some detached rocks, from which, however, the northern shore appears to be free.

Town.—Pier.—A white fort with a small flagstaff stands about 40 yards inland 8 cables southward of Gable point, and a white blockhouse on the rising ground about 500 yards inland from the port; these are good marks for the southern anchorage, and also for making the place from seaward. A considerable village extends along the shore on each side of the fort, off which is a coral pier built out to the edge of the reef.

General charts 8c and 2523.

Plan 14, Mersa Halaib. Var. 2° 40′ W.

Supplies.—Good water is to be procured near the South anchorage, at some wells in the vicinity of the fort and blockhouse before described, about 500 yards from the beach; firewood is scarce. Sheep can be obtained at reasonable prices, but a day's notice is required, the flocks being in the hills. A plentiful supply of good fish may be had with the seine, just northward of the village. Grouse can be shot in the neighbourhood of the wells.

Directions.—The 2-feet rock on the spit near Sea point is a useful mark in approaching the harbour. When close to the entrance, the eye becomes the only guide, and it is therefore necessary that the sun should be in a favourable position either in entering or leaving; the reefs on the starboard hand in entering should be kept on board as they are more easily seen than those on the port hand. No vessel, however, of any length should attempt to enter without first buoying the extremes of both reefs. A vessel proceeding to the South anchorage must be very cautious in rounding the North-west rock, in order to clear the shoals extending northward from it.

In 1902, H.M.S *Scout* approached this harbour with the blockhouse open its own width northward of the fort bearing S. 48° W.; and anchored outside in 9½ fathoms on this line, with Sandy island bearing N. 21° W.

CAUTION.—A small double reef is charted about 8½ miles East from the entrance to Mersa Halaib. There is reason to suppose that this is only part of a shoal of considerable extent, for the *Scout* observed five shoal patches in passing this vicinity. In 1889, that vessel reported passing another shoal, about 3 miles off the entrance of Mersa Halaib, in approximately lat. 22° 15¼′ N., with estimated depths of from 3 to 4 fathoms. H.M.S. *Albacore*, in passing within 5 cables of the spot indicated, reported that with a look-out aloft no sign of shoal water could be seen in this locality; until the doubt as to this latter shoal is determined, great care should be exercised in approaching this harbour.

Between Mersa Halaib and cape Elba, 18 miles south-eastward, are two reefs from 1½ to 2 miles off-shore, as charted; reefs front the shore as far southward as the northernmost reef, thence the shore is apparently clear of reefs.

Chart 8c, Red Sea, Sheet III.

CAPE ELBA (*Lat. 23° 3′ N., Long. 36° 52′ E.*), is so called from its being the terminating point of the Elba mountains. These mountains are very remarkable, and are

Chart 8c, Red Sea, Sheet III. Var. 2° 40′ W.

almost always seen by vessels passing up or down the centre of the sea. *See* view A on chart.

Elba reef is 3 miles in extent north-west and south-east; from its north-western point, cape Elba bears W. by N. 6¼ miles.

Mersa Bela.—Between Elba reef and the shore is a mass of reefs, amongst which, however, anchorage may be found, and there is a clear passage down the coast in-shore of them. Abreast of their south-western end is the entrance to Mersa Bela, 4½ miles south-westward of cape Elba. In this small cove, there is just room for a gunboat with a very short scope of cable out; the anchor being let go in 5½ fathoms, stiff mud, she will swing towards the head of the Khor in 15 feet over coral rocks.

COAST.—Outlying reefs.—Between cape Elba and Ras Raweiya, 65 miles to the southward, the coast recedes, and contains several small anchorages as described below. It is fringed by reefs with many outlying dangers. The farthest off shore being at about 12 miles abreast Khor Delaweb, as charted. Farther southward is Shab Dhu-l lawa, described on page 160.

Anchorages.—Between cape Elba and Khor Shinab, the breaks in the coast reef give access to many inlets, most of which affords good anchorage, care being taken to avoid the numerous detached reefs above mentioned; under many of these reefs temporary anchorage is also to be found, the eye being the only guide. Some of these reefs are several miles in extent, especially that fronting the coast between Khor Delaweb and Sherm Abu Amara Farat, which occupies a space 6½ miles long by 3½ miles wide.

Khor al Maarúb, 3½ miles northward of Eeles cove, has the appearance of a roomy anchorage but has not been examined.

Plan of Eeles cove on sheet 1109.

Eeles cove (*Lat. 12° 48′ N., Long. 36° 52′ E′.*) lies at the head of the opening in the reef, one mile in length by about a cable in breadth, depths of from 8 to 12 fathoms. The outer part trends in a west-north-west direction for about 8 cables, thence trending west-south-westward for about 4 cables. There is anchorage in 7 to 8 fathoms over mud and sand in the cove, a third of a mile from its head, where it is 1¼ cables wide between the coral reefs on either side, affording swinging room for small craft only. The reefs project 3½ cables from the shore at the entrance points.

Plan 1109, Eeles cove. Var. 2° 40′ W.

Anchorage may be found in the northern bight, which is about the same size as the cove, in 10 fathoms.

Chart 8c, Red Sea, Sheet III.

Inlet.—About 2 miles southward of Eeles cove is another and larger inlet; its outer northern point is low and sandy, the coast reef extending about 3 cables from it; the southern point is of coral rock 5 or 6 feet high, and the reef extends rather farther from it than on the north side. There are depths of 12 and 13 fathoms in the entrance, decreasing to about 10 fathoms at the head, where the inlet spreads out into three arms, and there is room here for a vessel to lie at single anchor by taking a central position.

Khor Abu Fanadir in lat. 21° 42½′ N., and Khor Delaweb, 6 miles farther southward, are inlets very similar in character to those just described; in each, the entrance appears to be clear of danger, though narrow between the reefs; and, in each, near the head, there is anchorage with swinging room for one moderate-sized vessel.

Landmarks.—Abu Hamama (*Lat. 21° 29′ N., Long. 36° 55′ E.*), is a table-topped hill near the coast; it is one of a low range which continues from thence southward and terminates in small straggling hummocks a little southward of Khor Shinab. Haycock peak, in lat. 21° 19′ N., is the southernmost but one in this coast range.

Plan on 1109, Sherm Abu Amara Farat.

Sherm Abu Amara Farat (*North point, Lat. 21° 31′ N., Long. 33° 33′ E.*).—In approaching this islet from seaward, the hill Abu Hamama, rising close to its head, is a good mark both for clearing the shoals outside and for leading up to the entrance between the shore reefs, which extend nearly 5 cables from the respective points. The entrance channel is about 2 cables wide in a west direction, with from 15 to 13 fathoms, thence diminishing to one cable in width abreast North point and trending south-westward; in the harbour, the centre of the channel is occupied by Middle shoal with as little as one foot water, beyond which is a roomy inner anchorage about 3 cables wide, with from 8 to 10 fathoms, mud or coral. The most convenient anchorage, however, is before reaching Middle shoal, abreast of North bay, in 12 fathoms, and with a clear width between the shoals of 2 cables. There is a passage to the inner anchorage on either side of Middle shoal, but that on its eastern side is the widest and safest. The land on both sides is very low, and the northern shore is the best to keep

Plan on sheet 1109, Sherm Abu Amara Farat. Var. 2° 40′ W.

aboard as far as Middle shoal, the reefs on that side being very steep-to. There is no difficulty in seeing the reefs if the port is entered before noon.

Three bays, North bay, North-west bay, and South-east bay, branch off from the main channel of the port; they are, however, all encumbered with coral reefs and have not been examined.

Plan on chart 8c, Khor Dhú-L Lawá.

Khor Dhú-L Lawá (*Entrance, Lat. 21° 26′ N., Long. 37° 0′ E.*), 7 miles south-eastward of Sherm Abu Amara Farat, extends about 2 miles inland, but is only one cable wide, and in one part not more than one third of that is navigable; its entrance is a gap in the coast reef, having a depth of 18 fathoms, and decreasing within to 15 and 11 fathoms. A small steam vessel or sailing vessel with a fair wind may run in here and anchor, but there is little space for swinging until $1\frac{1}{3}$ miles within the entrance, and no room for working.

Chart 8c, Red Sea, sheet III.

Shab Dhu-l lawa.—From 3 to 5 miles north-eastward of Khor Dhu-l lawa is the reef of the same name, which generally breaks, from the southern part of which Abu Hamama hill bears W. by N. $\frac{3}{4}$ N. This reef covers a space of about 2 miles.

Plan on chart 8c, Red Sea, Khor Shinab.

Khor Shinab (*Lat. 21° 21′ N., Long. 37° 3′ E.*), is situated nearly 5 miles south-eastward of Khor Dhu-l lawa; It is entered through a narrow gap in the coast reef, with depths of 12 to 11 fathoms, and it extends about 4 miles inland.

Entrance.—The coast reef extends between 6 and 7 cables from the northern point of entrance, and $5\frac{1}{2}$ cables on the southern side; here the channel is upwards of one cable wide, with from 30 to 15 fathoms water, the depth decreasing through the channel as the head is approached. A sailing-vessel may run in with a fair wind, but there is no working room in it.

The entrance is open on a W.S.W. bearing, to Sandy spit, where it turns sharply north-westward for about $\frac{3}{4}$ of a mile, whence it has a general westerly direction towards the head, where the Khor terminates in three small but deep bights, one to the northward, another to the southward, and a third westward in the general direction of the channel. At the head of the latter is Quoin hill, which is useful as a mark when approaching, as mentioned below.

General charts 8c and 2523.

Plan on chart 8c, Khor Shinab. Var. 2° 40′ W.

Neither wood, water, nor fresh provisions are to be obtained at this inlet, which is the southernmost of the nine just described, all lying between cape Elba and Ras Raweiya.

Directions.—The forenoon is the best time for entering, the reefs being scarcely discernible in the afternoon. In approaching Khor Shinab from the north-eastward, great care must be taken to avoid the outer sunken rock, which bears N.E. by E. ½ E., 6 miles from the entrance. This rock seldom breaks and is difficult to discern even with a good look-out aloft; another and much larger reef lies in the same direction, about 2½ miles from the entrance; there is deep water between these reefs. The Paps in line with Quoin hill, bearing W. ¾ S. leads into the entrance of the Khor, southward of these dangers.

In the entrance, the northern fringing reef is the most easily seen, as some parts are above water. The best anchorage would appear to be well up the harbour, the outer part being very narrow.

Landmarks.—Quoin hill has a projection from its southern and highest brow, and is, as before described, close to head of Khor Shinab, and northward of the Haycock peak.

The Paps form a notch in the centre part of the highest hill about 23 miles inland from the entrance to Khor Shinab.

Chart 8c, Red Sea, Sheet III.

COAST.—Dangers.—From Khor Shinab, the coast trends south-eastward about 23½ miles to Sandy cape, the north-eastern point at the head of Raweiya peninsula. The whole extent is fringed by reef, and in the first 12 miles are three off-lying reefs, all within 3 miles of the shore. Of these, two are reefs 3½ miles and 5¼ miles respectively south-eastward of the entrance of Khor Shinab; next follows Shab Kummere, beyond which are no off-lying dangers until Sandy cape is approached.

Shab Kummere, (*N.W. End, Lat. 21° 16′ N., Long. 37° 10′ E.*), lies parallel with the shore for nearly 5 miles, its outer edge being 2¾ miles, and its inner edge one mile distant from it. From its north-western end, Haycock peak bears N.W. by W. ¾ W. 8¼ miles. On its eastern and south-eastern sides, the reef is steep-to in the channel. Between it and the shore, but near the reef, are a few small patches which can be seen by a good look-out. *See* view C on chart, showing appearance of the land from a position immediately outside this shoal.

General charts 8c and 2523.

Chart 8c, Red Sea, Sheet III. Var. 2° 40′ W.

Sandy cape, the north-eastern extreme of the Raweiya peninsula, is 2½ miles north-eastward of Ras Raweiya bluff. Isolated reefs, steep-to, are situated from 2 to 3 miles eastward and south-eastward of it.

RAS RAWEIYA is the central bluff point at the termination of Raweiya peninsula, which peninsula is only a mile wide at its commencement abreast of Shab Kummere, but, projecting about 13 miles in a south-easterly direction, is upwards of 4 miles wide at the Ras, which has low sandy points, about 2½ miles distant from it on either side, terminating the promontory in those directions. This south extreme of the peninsula is encumbered by shoals, but there is a large stretch of open water in the deep bay on its western side not easy of access. When approaching Ras Raweiya from an east-north-east direction, the bluff makes as an island, which might be mistaken for Makawar island, but the absence of outlying islands should prevent this error; on a closer approach, the low connecting coast of the peninsula will be seen from aloft.

Chart 8c, Red Sea, Sheet III., and Plan 1109, Anchorage of Raweiya.

DOKHANA BAY is the general name of the extensive inlet enclosed by Ras Raweiya and the reefs extending southward from it, from the southern end of which the bay recedes nearly 20 miles in a north-north-westerly direction; the southern part or mouth of the inlet is encumbered by small islands, reefs, and shoals. The part more particularly called Dokhana bay is a small bay on the western side, about 9 miles northward of Baidib or Mahommed Ghul.

Entrance.—Bar.—The bay has good anchorage and plenty of water when once inside, but, at the north-western part of the eastern inner entrance, according to the plan, the reefs extending eastward from Sand island (the easternmost of the three cays, charted as sand patches, the extreme of which is marked by a beacon not to be relied on), is connected with the Raweiya reef by a bar, over which not more than from 2½ fathoms water can be carried; and as Sand island is said to be connected with the shore by another reef, with from 9 to 12 feet, Dokhana bay is practically closed to all but small vessels. A detailed survey might result in finding a better passage.

A passage of 2¼ fathoms through the reef westward of Sand island was sounded by the *Cygnet* in 1885–6, at the season when the water was at its highest level.

The *Starling* succeeded, by the aid of a boat ahead, in worming her way across the bar eastward of Sand island and

Chart 8c, and plan 1109, Anchorage of Raweiya. Var. 2° 40′ W.

proceeded to the very head of the bay, returning by the same route.

Water.—Better water may be obtained at the anchorage in the inner bay of Dokhana than that generally met with on this coast. The well is about a mile from the beach, to which water casks may be rolled and filled, or the water may be purchased of the natives. Neither fresh provisions nor firewood are to be procured.

Directions.—To enter Dokhana bay, a vessel should haul up north-westward after rounding the Raweiya shoals, marked P.D. on plan, as the best entrance is apparently in this direction; passing between the beacon and the cay 8 feet high, charted as being covered with bushes, in about 2½ fathoms; navigation is by eye, and it should not be attempted by vessels drawing more than 12 feet.

DANGERS.—Between Ras Raweiya and Mayeita island is a continuous mass of rocky patches and deep narrow channels, including two small sandy islets and a reef showing above water north-eastward of Mayeita island, now to be described.

Umm el Kurush, Shab Baraya, and Abington reef (*Lat. 20° 53½′ N., Long. 37° 26½′ E.*).—The last named is the outer reef of those here referred to and lies in the approach to both entrances; it is a coral patch, circular in shape, about half a cable in diameter, and shows above water; from it Umm el Kurush bears S.S.W. ½ W. about 2 miles.

Umm el Kurush, the easternmost of the two sandy islets, lies 7 miles N.E. by E. from Mayeita, and has two other reefs, within 2 miles of it, in line with that island.

Shab Baraya, the western sandy islet, is 3 miles westward of Umm el Kurush, and is on the southern end of a large reef extending 4 miles to the northward, on which the East India Company's sloop of war *Nautilus* was wrecked in the year 1833.

In-shore of Makawar island and sheltered by it and the reefs northward of it, are the harbours of Mohamed Gul and Mukaffal.

RAWAYA ANCHORAGE is formed and protected by a series of shoals, reefs, and islets, more or less connected with the shore between 2 and 3 miles northward of Mohamed Gul, extending eastward from the shore 3½ miles, and then turning south-south-eastward a farther distance of nearly 4 miles, having near its southern extreme Engineer islet, a sandy islet about 8 feet high covered with shrubs.

General charts 8c and 2523.

Chart 8c. Var. 2° 40′ W.

The anchorage is several miles in extent, well sheltered; with depth sufficient for all vessels; a good berth is in 5½ fathoms, sand, and good holding-ground, with Bathing island, distant 7 cables, on with the high land of Ras Rawaya N.N.E. ½ E.; and St. Fillans islet S.E.; northward of this position the ground is foul.

Land mark.—**Jebel Tariba** (*Lat. 20° 50′ N., Long. 36° 50′ E.*), is a high mountain about 19 miles inland from Mohamed Gul; it is a very useful mark from seaward for approaching either of the entrances. On the northern part of the summit are two small rugged heights, of which the northernmost is seen from Awi Teri to Khor Dhu-l lawa, a distance of 80 miles; at the latter, it shows as the highest part of land to the southward.

Small Peak, on the near hills, and not shown on the chart, has a flat top, and is a little northward of Jebel Tariba. The Sugar-loaf, also not marked, is a peaked mountain in the range between Jebel Tariba and the coast.

Directions.—**The northern entrance** to the anchorage, fit only for small vessels until properly surveyed, is between this islet and that of St. Fillans, already described; the two islets are less than 7 cables apart, and the navigable channel between them is about 2¾ cables wide. The plan shows a pecked line for the best track with least depth of 5 fathoms in the channel, but there may be less water. North-westward of Engineer islet, are two other islets on the reef; Bathing island, only about one foot above water and 2 cables in length, and with a shallow channel on either side of it, and Shark reef and Middle reef between it and Engineer islet and Sand island, 6 feet high, the easternmost of three sand patches before referred to (*see* page 162), and covered with bushes.

On rounding the southern edge of the Raweiya reef the channel between St. Fillans and Engineer islets is open. Pass through it in mid-channel, and, having cleared the south-western spit of Engineer islet, either haul up for the Raweiya anchorage or steer about W. ¾ N. for the anchorage off Mohamed Gul.

The *Scout* put to sea by the northern route, and reported that after passing between Engineer and St. Fillans islets, the course was East, (not N. 75° E. as would appear by the plan). The northern edge of the reef extending eastward from St. Fillans was less broken and more easily seen than that on the other side of the channel. This latter reef is, however, marked near its eastern end by two small rocks just above water and about 100 yards apart. Having rounded this

Plan on 1109, Mahommed Ghul. Var. 2° 40′ W.

extreme a rock 5 feet above water will be seen farther northward on the same reef, and this must be passed closely to avoid some patches on the eastern side of the channel.

Plan on sheet 1109.

MOHAMED GUL or BAIDIB (*Lat. 20° 54′ N., Long. 37° 10′ E.*). This village has a fort and flag-staff, landing-jetty, and custom house, but, with the exception of one large stone building, as yet consists entirely of Arab huts, the place having been destroyed in the rebellion of 1882; north-north-eastward of Mahommed Ghul anchorage are some buildings with a high chimney in connection with the Raweiya salt works; these are very conspicuous. Mahommed Ghul has both an outer and inner anchorage; the former is known as the anchorage of Raweiya, the latter as the anchorage of Mahommed Ghul. It may be approached by the entrance south of Engineer islet, said to be suitable for small vessels only, or that southward of Makawar island which is available for large vessels.

Large quantities of salt are exported every year, both by native craft and by steam-vessels, the salt being brought alongside vessels in the Rawaya anchorage from the salt pans of Rawaya, in native sambuks, ranging from 25 to 100 tons.

Mohamed Gul anchorage is approached from Raweiya anchorage before described; the entrance is narrow and winding, but with care a handy steam-vessel should be able to anchor within a cable of the jetty at its head in about 6 fathoms, mud bottom, without crossing anything less than 5 fathoms water. There are two stone beacons 6 feet high, one on either side of the channel, to assist in its navigation; but the chart, the eye, and the lead are better guides than any description. The track recommended is shown by a pecked line, southward of a sunken rock charted 3½ cables north-eastward of the stone beacon.

MOHAMED GUL.—Southern approach.

Makawar island (southern end,) (*Lat. 20° 41′ N., Long. 37° 15′ E.*) is situated on the northern side of the southern entrance to Mohamed Gul, which is the entrance for large vessels. This island is 6½ miles long, north and south, and about 1½ miles wide; it is about 4 miles from the coast, and lies nearly parallel with it. From its northern end, Ras Rawaya bluff bears N. ½ E., 10 miles. It is rather high table-land composed of rocky sandstone, in steep cliffs, apparently worn away by heavy rains. It has a very sterile appearance, there being nothing on or about it but rocks,

Plans on sheet 1109, Mahommed Ghul, and chart 8c, Red Sea. Var. 2° 40′ W.

barren sands, and shoals, except on the southern point of the island where there are a few mangroves. The remains of two rough but dry wells were found at the northern end, but no vestige of a tank or any other building.

The island is surrounded by a coral reef extending upwards of 3 miles from its northern end, with the small low sandy islet of St. Fillans, only 4 feet above water, at its north-western edge; a remarkable rock about 8 feet above water, lies 5 or 6 cables eastward of the islet. The northern edge of this reef forms the southern side of the northern entrance to Mohamed Gul.

Anchorage.—A rocky spit extends a mile off from the southern end of Makawar, with a patch of sand at its south-eastern edge sometimes above water; there is anchorage in 12 fathoms on the south-eastern side of this spit, and also on its western side in any depth required.

REEFS BORDERING THE FAIRWAY.—Falcon reef.—This reef or line of reefs lies about 2 miles south-eastward from the southern end of Makawar on the south side of the entrance channel to Mohamed Gul, and is about $2\frac{1}{2}$ miles long north and south, with less than 6 feet water over the northernmost rock. Other equally dangerous rocks lie between this and the southern end of the reef, the only part discovered and named by the *Falcon* in 1884.

Several shoals of considerable extent, but chiefly off unknown depths, lie both northward and westward of the Falcon reef, but leaving a clear passage about $1\frac{1}{2}$ miles wide between them and the rocky spit extending from Makawar.

Powell rock, with 5 feet water, lies S.S.W. $\frac{3}{4}$ W. $2\frac{8}{10}$ miles from the South spit of Makawar island.

Merlin rock, with less than 6 feet, lies near the fairway with the summit of Mayeita island bearing N.N.E. $\frac{7}{8}$ E. distant $4\frac{1}{10}$ miles. One mile S.W. by W. from Merlin rock, there is another danger, and foul ground extends all the way from the later to Falcon reef.

Brandon rocks, with 2 fathoms of water over them, are situated in the fairway with the south extreme of Makawar island bearing W. by S. $\frac{1}{4}$ S. distant $3\frac{2}{10}$ miles. They are about 3 cables long and the same in width and have deep water close round them.

Mayeita (*Lat. 20° 47′ N., Long. 37° 20′ E.*), is a small island, 143 feet high, having its northern slope covered with small trees and scrub, and appearing fertile, while its south-

Chart 8c, Red Sea, Sheet III. Var. 2° 40′ W.

eastern and eastern sides are barren. It is situated 3¼ miles eastward of Makawar, on the south-eastern part of a coral reef 4½ miles long and nearly 2 miles wide; the reef has on it another small island, one mile north-westward of Mayeita, showing about 2 feet above high water.

This reef extends nearly a mile southward of Mayeita; at 2 miles south-westward of this island is the patch of sunken rocks just now referred to in the description of the Falcon reef. The southern part of Makawar bearing about W. by N. ¼ N. leads through between them.

There is a channel between Mayeita and Makawar island, but with many sunken patches in it.

Plans on sheet 1169 and Chart 8c.

COAST.—Khor Mukaffal (*Lat. 20° 47′ N., Long. 37° 10′ E.*), is about 7 miles southward of Mahommed Ghul and abreast of the southern part of Makawar island; it is formed by a narrow break in the coast reef and has good anchorage for bágalas, but neither wood nor water can be obtained. Nearly 2 miles southward of it is Little Mukaffal, with a shoal patch which sometimes breaks 1½ miles eastward of it in the Makawar channel, here nearly 4 miles wide. It is entered by the southern entrance before described.

Directions.—The southern and main entrance to these anchorages may be taken by vessels of moderate draught. Heavy draughted vessels should buoy the channel before entering. Having made Makawar, the southern shoulder of its high land should be brought to bear W. ¾ S., then steer W. by S. ¼ S., passing 3 or 4 miles southward of Umm el Kurush, and from thence W.S.W. until 2½ miles southward of Mayeita, keeping a sharp look-out for the sunken reef 2¼ miles S.S.W. of that island. Dabadiba hill, S. 67° W., leads in in not less than 7 fathoms of water. Having passed this reef, steer W. ¾ S. to pass, in not less than 9 fathoms, the southern spit of the Makawar reef, and passing between Makawar and the Brandon rocks, which sometimes break but are not easily seen. A N. by W. course leads to the anchorage off Mohamed Gul.

Dabadiba anchorage.—Tiflah channel.—Dabadiba anchorage is about 9 miles southward of Khor Mukaffal. The Tiflah islands and their encircling shoals are just southward of it, and between them and the mainland is the channel in; it is only 5 cables wide, but by preserving a mid-channel course, the depths are from 5 fathoms in the southern entrance to 7 or 8 fathoms through the channel; the anchorage bears from the northern part of the islands W. by N. ½ N. 2 miles.

General charts 8c and 2523.

Chart 8c, Red sea, Sheet III. Var. 2° 10′ W.

This anchorage is small, but the bottom is mud, and good protection from northerly winds may be found by anchoring close up inside the point of the reef.

Dabadiba hill (*Lat. 20° 39′ N., Long. 37° 6½′ E.*) is a good mark in clearing the shoals on this part of the coast; when seen from the south-eastward it somewhat resembles Gibraltar as seen from the westward, but is smaller.

Tiflah islands are about 5 cables off-shore, near Dabadiba, and consist of three sandy islets, of which the two most eastern are covered with bushes, and the western one partially so; they are surrounded by shoal water and sunken patches of rock, which sometimes break, the two outer reefs lying about S.E. and S.E. by S. 7 miles respectively from the islands.

Inner channel.—The channel within the Tiflah islands though very narrow has depth of from 5 to 7 fathoms in the fairway. It affords smooth water to small craft passing up and down.

Anchorage.—Anchorage may be had under the westernmost Tiflah islet with protection against northerly winds in very irregular depths of from 10 to 4 fathoms; protection against southerly winds may also be found in irregular depths of from 5 to 14 fathoms, 1½ miles northward of the Tiflah islands.

Katat el Banna (*Lat. 20° 42′ N., Long. 37° 22½′ E.*), the outermost reef in the neighbourhood of the Tiflah islands, appears to be about one mile in extent north-west and south-east, with its shoalest rock at the north-western end; it is quite isolated and surrounded by deep water; its north-western rock lies S.S.E. 7½ miles from the southern end of Mayeita island; and, from it, Dabadiba bears W. ½ S. 11 miles.

Land marks.—Chimney hill, so called from its similarity to a chimney, is 25 miles south-westward of Dabadiba; it is at the southern extreme of the Tariba range. *See* views *b* and *c* on chart .

False Chimney hill (*Lat. 20° 19′ N., Long. 36° 37′ E.*), 7,444 feet in height and about 11 miles south-westward of Chimney hill, is just in sight off Port Súdan, appearing as a high mountain with rugged top, assimilating in appearance to chimneys. Off Mersa Ar-rakiya and Awi Teri it appears as a sharp-peaked mountain like a sugar-loaf, and from a vessel off Salaka, when bearing W. ½ S., its top is seen just above the northern brow of a dip in Table mount, a round elongated mountain about 1,100 feet high, and 4 or 5 miles inland from Salaka.

General chart 2523.

Chart 8c, Red Sea, Sheet III. Var. 2° 40′ W.

Jebel Gomadliba (*Lat. 20° 2½′ N., Long. 36° 33′ E.*), formerly known as mount Kumad Rabat, is a very remarkable mountain, 6,137 feet high, nearly 20 miles southward of the highest peak of False Chimney hill, and 26 miles inland from Mersa Fejer; its summit terminates in a sharp rocky horn which does not greatly alter its appearance by change of bearing, though having a shoulder on its southern side; it may be seen from the island of Makawar to the northward. It is visible some 30 miles down the coast and as far southward as Mersa Amid. *See* views B on chart 8c.

SALAKA (*Lat. 20° 27′ N., Long. 37° 11′ E.*), is about 35 miles southward of Ras Raweiya. A sandy spit bordered by the coast reef, projecting in a south-westerly direction, forms a small bay on its western side, in which Salaka is situated. The entrance is between the sandy spit and some sunken rocks southward of it, on which the discoloured water may be seen in clear weather. In this bay is anchorage in 9 or 10 fathoms, mud, surrounded by patches of sunken rocks; it is, however, doubtful whether the sunken rocks in the entrance afford sufficient protection in strong southerly winds. Some rocky patches lie nearly in mid-channel between the fringing coast reef and the outer reefs about 6 miles southward of it, as well as off Salaka, and the narrowest part of the inshore channel is only half a mile southward of this place.

Directions.—A vessel entering the bay may either round the sand-spit closely, leaving the sunken rocks southward of it on the port hand, or may pass in between these sunken rocks and the shore reef southward of them, this latter being rather the widest channel. In either case the passage is very narrow and intricate, and the eye the only guide. A least depth of 3 fathoms, rocky bottom, was found in both entrances.

Outer anchorage.—Vessels not wishing to enter this intricate bay may obtain indifferent anchorage, with bad holding-ground, outside the sandy spit on the southern side of its reefs, but the water deepens quickly off it; the surveying vessel *Benares* anchored in 3½ fathoms, rocks and sand, and when brought up was in 10 fathoms, rocks and sand. This anchorage could not be taken up in a southerly wind. No supplies of any description were to be obtained.

Little Salaka is a mile southward of Salaka and is only a narrow break in the reef leading into a cove encumbered with shoals; a fit anchorage for nothing larger than boats.

The inner channel to the southward from Salaka is between the fringing shore reef and the outer reefs, and is

Chart 8c, Red Sea, Sheet III. Var. 2° 40′ W.

only 2 cables wide in the narrows. At from 3 or 4 miles southward of Salaka, it opens out to a general width of 2½ miles; the rocky patches lying nearly in mid-channel about 6 miles southward of Salaka should be passed on their eastern side; the depth is from 14 to 24 fathoms in the narrow part of the channel near Salaka; elsewhere the water is generally deep. The channel is useful to small craft making up or down the coast, as it offers smooth water, but the navigation is by eye alone.

CAUTION. — Anchorage. — In cloudy weather it is sometimes difficult to discern sunken rocks and patches; it is then advisable to remain at anchor at Salaka, or at some other anchorage in the neighbourhood of the reefs, until the weather clears. If coming from the southward, anchorage, in 7 or 8 fathoms, rock and sand, may be found about 2 miles southward of the sandy spit at Salaka, under the two small patches westward of the largest reefs bordering this narrow part of the channel.

Anchorages on rock and sand may also be obtained under the lee of many patches of the outer reefs southward of Salaka and Mersa Darur, especially north-eastward of Ar-rakiya, under the southern part of the reef, in 10 fathoms.

Shab Suadi (*southern end, Lat. 20° 7′ N., Long. 37° 16′ E.*). —From abreast of Salaka, a series of reefs, having narrow openings and outlying patches, extends 18 miles in a southerly direction, their outer edge being nearly 7 miles from the shore, and their inner edge, when clear of the narrows at Salaka, from 3 to 4 miles, forming the eastern side of the inner channel above mentioned.

The southernmost of these reefs is Shab Suadi, and its southern end is about 4 miles from the shore; from this it extends 6½ miles in a north-north-east direction with several rocky heads showing a few feet above water; its northern extreme being eastward of Mersa Ar-Rakiya. Inner channel southward, *see* page 172.

MERSA AR-RAKIYA (*Lat. 20° 12′ N., Long. 37° 10′ E.*). —This harbour is 14½ miles southward of Salaka and 36 miles northward of Port Súdan. The coast southward towards Awi Teri has some rocky patches near its reef, and the entrance to this place is surrounded by them, with deep water close to. Abreast of the anchorage, presently described, is the entrance to a little land-locked harbour 4 or 5 cables in extent, but with a small coral islet in the entrance reducing its navigable width, northward of the islet, to about 30 yards, with a depth of from

Plan on chart 8c, Mersa Ar-Rakiyá. Var. 2° 40′ W.

6 to 8 fathoms; the interior of the bay has also from 6 to 8 fathoms, but has so many little coral heads rising to within a few feet of the surface as to make it quite unfit for anything but boats or small dhows.

Water.—About 300 yards from the north-western shore of this harbour, are two wells of slightly brackish water.

Anchorage.—The only anchorage for vessels is on the eastern side of the small coral islet lying in the entrance to the harbour; the space is a quarter of a mile in length and rather over a cable in width between the reefs on either side, and which, with northerly winds, makes it necessary to keep the weather side of the khor close on board; the holding-ground is excellent. In mid-channel, the soundings are 12 fathoms, mud, and there is smooth water with all winds. There is only room for one vessel at single anchor, with a short scope of cable out, but two moderate sized vessels might possibly lie moored here.

Directions.—The best approach is round the southern end of Shab Suadi, which is marked by rocks above water, and from thence, to avoid the detached reefs on the inner side of that shoal, keeping the shore reef aboard until abreast of harbour entrance.

Another channel is through an opening in the reefs northward of Shab Suadi; this channel is about 5 cables wide, with the mouth of the harbour open; two small patches are left on the starboard hand, Jebel Gomadliba mentioned on page 169, being then on with the southern end of the small coral islet on the south side of the entrance of the inner harbour, bearing W. by S. $\frac{1}{4}$ S.

This latter channel is frequently used by native craft trading between this and Jidda; it cannot, however, be recommended as safe for ordinary vessels, and should not be resorted to. Arab traders use it because, with moderate northerly winds, they fetch Jidda from it, thus avoid working up through the narrow and intricate parts near Salaka. With fresh northerly winds it is customary for these vessels to work up from anchorage to anchorage on this shore, daily, until abreast of Makawar, from whence they stretch across to Jidda.

Mersa Awi Teri (*Lat. 20° 2′ N., Long. 37° 12′ E.*).—At $3\frac{1}{2}$ miles south of Mersa Ar-rakiya is Awi Teri; it is merely a gap in the coast reef, 3 cables wide at the entrance and about the same length, with 26 fathoms, mud, in mid-channel, which decreases to 8 fathoms close to the reefs. Country boats anchor close in, and there is just room for a small vessel to lie in

Chart 8c, Red Sea, Sheets I., II., III. Var. 2° 40′ W.

20 fathoms, moored head and stern, with the bower anchor let go as close to the northern reef as possible, and very little cable out, but it affords very little protection. A small stream runs into the head of the cove, which makes this a favourite anchorage with native craft.

Chart 81, Mersa Darúr to Trinkitat, and 8c, Red Sea, Sheet III.

INNER CHANNEL TO PORT SUDAN (*N. end, Lat. 20° 5′ N., Long. 37° 15′ E.*). Between Shab Suadi and the reefs southward of it is an opening 5 miles wide, leading to the inner channel from Mersa Fejer to Port Sudan. This channel is 2 miles wide between the fringing reefs, and with depths of from 30 to 40 fathoms in the fairway, which is marked by a pricked line on the chart.

Plan 205, Mersa Fejer.

MERSA FEJER (*Lat. 20° 2′ N., Long. 37° 12′ E.*) is situated on the west side of the inner channel above mentioned. It is an inlet 2 miles long and parallel with the coast within a peninsula 1½ in length and about 15 feet high, and fronted by reefs a mile in length on its seaward and south side. The entrance is southward of an islet, the observation spot, situated half-a-mile southward of the peninsula, and it is about a cable wide within, it tapers northward to a narrow muddy creek at the head. The place is choked by reefs, and shoals, on which are many small islets. The anchorage space is therefore very limited and only suitable for very small vessels; for such the depth is ample.

Outer anchorage, well protected and suitable for short vessels, may be found in the bay formed in the northern fringing reef outside the harbour. The southern end of this reef tails off abruptly into a depth of about 6 fathoms. Vessels making for the anchorage should pass close round this point, as the area of 4 fathoms to the southward culminates in a dangerous and invisible head with only 13 feet over it, leaving a channel one cable wide between it and the point of the reef referred to. When past this coral head anchorage may be taken up in about 12 fathoms in the centre of the bay in the coast reef.

No inhabitants were seen at Mersa Fejer when visited by H.M.S. *Sealark* in 1905; no water fit for use was obtainable. Gazelle and other game seemed to be fairly plentiful a short distance inland.

Directions.—When abreast of the entrance, Gomadliba summit bears N. 82° W. When visiting Mersa Fejer, H.M.S. *Scout* (1902) found the following to be useful marks to lead up to the entrance; viz., Weihemehi tower on with the Paps until

Plan on sheet 205; Mersa Fejer. Var. 2° 40′ W.

Barn hill bore N. 47° W. which latter line leads into the entrance. Barn hill being near the coast is conspicuous and often seen when the high mountains inland are hidden by clouds.

OUTLYING REEFS.—The reefs outlying Mersa Fejer and the coast southward to port Sudan to the distance of 10 miles are described on page 175.

Mersa Arús is a small harbour 1½ miles southward of Mersa Fejer; many shoal patches lie off the fringing reef between them; some are 4 cables from it, and one small 8 feet rock as much as 5 cables off the reef, and in the centre of the approach to Mersa Arús. The entrance channel to this little harbour is only half a cable wide in places and decreases in depth from 9 fathoms in the outer part to 2 and 3 fathoms between the entrance points, the harbour itself having only from 7 to 8 feet water and therefore being only fit for boats.

Khor Gawateri enters the head of this bay, and at times discharges heavy flood waters. About 3 miles south-westward of it is the ancient Weihemahi tower before mentioned, square-topped, about 15 feet high, and plainly visible from seaward. There are remains of a burial ground around this tower.

Chart 8c, Red Sea, Sheet 111.

Coast.—Aspect.—The land near the coast in the vicinity of Mersa Fejer is very low, only 2 or 3 feet in height, with small coral hummocks 6 or 8 feet, and so continues southward to and beyond Mersa Darur; behind it the land is mainly desert dotted with low scrub and brushwood, and has several small plateaus from 10 to 20 feet high; farther inland, is a gently sloping plain from 10 to 20 miles wide extending to the foot of the mountains; in the winter, this plain becomes thickly covered with tussock grass 2 or 3 feet high.

About 7 miles inland is a remarkable series of sandy barren hillocks some 300 feet above the level of the surrounding plain. The lower hills of the mountains of the interior begin abruptly south-westward of this chain, and from that point, extend both southward and westward. The angle there formed is marked by a hill whose summit, 1,157 feet high, appears from the direction of Mersa Fejer as a sharp and regular cone, but in proceeding southward, shows as a rounded ridge.

Westward from this hill a wide level valley extends for 18 miles to Jebel Gomadliba, described at page 169.

Between Mersa Darúr and Port Sudan, the coast and land adjacent resembles that just described, viz., a low flat plain extending about 11 miles to the foot of the mountains. Here,

Chart 8c, Red Sea, Sheet III. *Var. 2° 40′ W.*

however, there are not so many khors and the country becomes still more barren, shrubs and other vegetation being very scattered and scanty.

Plan on 205, Mersa Darúr.

MERSA DARÚR (*Lat. 19° 50′ N., Long. 37° 16′ E.*), also in the inner channel leading to port Sudan, is 11½ miles southward of Mersa Fejer. It is entered through a fissure in the coast reef three-quarters of a cable wide with depths of about 4 fathoms, and the harbour itself forms the mouth of the largest khor in this region, caused by the junction 2 or 3 miles inland of the two khors Arbat and Darúr. The harbour is the space enclosed between the coast reef and sand bank northward, and flat three muddy islets southward each about 2 feet above water and covered with bushes.

The enclosure thus formed has depths of from 4 feet to 2½ fathoms over a limited space, but the winter freshets from the mountains bring down quantities of débris, so that the head of the harbour is silting up and the greater part is only about one foot deep at low water. The space available, about a quarter of a mile in extent with depths of 1½ to 2¼ fathoms, affords good shelter for small craft.

Directions.—Landmark (*Lat. 19° 50′ N., Long. 37° 15′ E.*).—From seaward, the position of Mersa Darúr may be known by a fairly large white house about a mile west-south-westward from the entrance; this house was formerly a police station but is now disused; it stands by itself amongst a few bushes, and is very conspicuous, especially with the morning sun shining on it. When bearing S. 72° W., it leads directly up to the entrance of the harbour. The point of the reef on the starboard hand in entering is marked by a small heap of boulders; that on the port hand is not so easily seen, especially in calm weather.

Landing.—At the eastern end of the inner islet in the harbour is a small and dilapidated stone pier, at which boats can land. From it, a path leads across the islet to a stone causeway which connects the islet with the mainland, and leads to the white house mentioned, and also to wells, where the water is brackish.

Supplies, &c.—In the winter, a few natives, belonging to sub-tribes of the Mussib family, graze their camels, flocks, and herds in this vicinity and also cultivate some patches in the khors; from these people, a few sheep and water melons may be purchased; camels may also be hired for a trip into the hill country.

General charts 81, 8c, and 2523.

Plan on 205, Mersa Kihai. Var. 2° 40′ W.

Anchorage.—Outside the easternmost islet, and just southward of the entrance, is a detached reef, awash in places when the water is low, and nearly always breaking; it is 4 cables long and one cable wide, with a channel, also one cable wide, with from 5 to 8 fathoms, and free from dangers, between it and the reef of the eastern islet. The best anchorage is in this channel, in 6 to 7 fathoms, described between the detached reef and the islet reef; but if anchored here, as there is but little swinging room, it is well to have a stern anchor on the reef to the south-westward, in case of a squall off the land at night, which is not uncommon.

Anchorage in 10 fathoms, may be found northward of this detached reef and a little northward of the harbour entrance, but it is very exposed considering the prevailing northerly winds.

Mersa Kihai (*Lat. 19° 39′ N. Long. 37° 15′ E.*), 11¾ miles southward of Mersa Darúr, is a khor extending from its entrance in a west-north-west direction for about one mile, with a width of one cable, and depths of from 10 to 20 fathoms; it then turns sharply northward for 1½ miles, and ends in a shallow bay 5 cables wide with from 10 to 12 feet in the outer part, but with several rocky patches of reef extending from the sides.

This inner portion offers good shelter to boats, but is too narrow at the mouth and too shallow at the head for anything much larger. The outer entrance is free from dangers; the narrow inner channel has about 17 feet water.

There is no anchorage off the entrance; patches outlie the northern reef about one third of a mile.

Coast reef.—Between Mersa Kihai and Port Súdan some rocky heads are separated from the shore reef by the distance of 2 or 3 cables as charted, and which should be given a berth.

Chart 8c, Red Sea, Sheet III.

OUTER REEFS.—Between Mersa Fejer and Port Súdan, the coast is fronted by reefs leaving a clear inner channel about 2 miles wide between them and the fringing coast reef, with depths of from 30 to 40 fathoms, described on pages 176 and 180.

The northern part of this barrier consists of a large area of reefs and shoals about 10 miles long, 6 miles wide, and lying approximately parallel with the shore.

The outer edge of this area shows plainly and consists of a narrow strip of reef, partly awash and partly covered, but, practically continuous for 10 miles. The inner limit of these shoals is not so clearly defined and is broken up into many small reefs, some not visible, whilst at the northern and

Chart 8c, Red Sea, Sheet III. Var. 2° 50′ W.

southern ends of the area are several small and dangerous coral heads rising abruptly from deep water.

The interior of this area has not been closely examined, but many breaking patches have been observed throughout its whole extent.

Shab Rumi (*Lat. 19° 56′ N., Long. 37° 23′ E.*).—This reef is of atoll form and rises abruptly from depths of 300 fathoms off the south-eastern side of the shoal area just described, between which and it is a channel, one mile wide, with depths exceeding 300 fathoms. This reef is always visible and the sea generally breaks along its outer edge.

Chart 81, Mersa Darún to Trinkitat.

The Mercier shoals.—Between the southern end of the shoal area just now described and the Wingate reefs, still farther southward, is a space of about 7 miles, of which the outer edge is marked by a series of small broken reefs known as the Mercier shoals. It might be possible for a vessel to find her way through these shoals to the Inner channel, but the attempt is not recommended, and would be most dangerous. At 1½ miles outside and eastward of these shoals is the dangerous Sanganat reef presently described.

Wingate reefs.—This mass of shoals follows the Mercier shoals, and closely resembles the large shoal area northward of that set of reefs, but is not of so great extent. The Wingate reefs have a well-defined outer wall and a broken inner boundary forming the border of the Inner channel. Their southern end is the northern boundary of the Fourth opening. The interior of this shoal has been partially examined and found to be full of patches rising from deep water, a space to be carefully avoided by the navigator.

Beacons.—A beacon with cage topmark painted chocolate stands on the eastern point of the Windgate reef. A beacon with a diamond topmark and painted chocolate stands on the southern point of the reef.

PORT SUDAN APPROACHES.—SANGANEB REEF (*Southern end, Lat. 19° 43′ N., Long. 37° 26′ E.*) is the eastern danger in the northern approach to port Sudan. This reef is of horse-shoe shape, open to west, 3 miles long north and south, and one mile wide. It is steep-to, generally breaks, and within the area enclosed affords anchorage in 25 fathoms, white clay mud. In the channel between it and the Mercier shoals the depths are upwards of 400 fathoms. To approach the anchorage, the entrance to which is about 2 cables wide and one mile northward of the south-western extreme of the reef, pass about three-quarters of a cable northward of the horn on the starboard hand, which shows clearly;

Chart 81, Mersa Darúr to Trinkitat. Var. 2° 50′ W.

and, after crossing a narrow ridge of from 5 to 8 fathoms, steer to the north-eastward and anchor in the middle of the reef.

For Towartit reef in the southern approach, *see* page 180.

LIGHT.—The lighthouse stands nearly in the position formally occupied by the beacon, viz., about 100 yards from the southern end of the reef. It is an open framework tower 180 feet high, painted brown, with the exception of the keeper's rooms and lantern, which are white. From it is exhibited, at 165 feet above high water, a *white flashing* light with a period of *five seconds*, visible 19 miles. The light shows thus :—flash, *half a second* ; eclipse, *four and a half seconds*. *See* sketch on Chart 81.

Current.—Near the Sanganeb reef, northerly or westerly currents of some strength may be experienced all the year round, but chiefly in the summer months. Sometimes, however, currents have been felt in the opposite directions but chiefly during the winter months.

Plan 3492, Port Súdan.

PORT SÚDAN (*Lat. 19° 36′ N., Long. 37° 14′ E.*).—This port, formerly known as Mersa Sheikh Bárud or Sheikh el Barghát, after the chief whose tomb on the northern point of entrance is still a good sea-mark, was selected, in preference to Suákin, to be the terminus of the Súdan and Red sea railway from the many advantages it possesses, and was formerly named and opened as such on January 27th 1906, the railway itself connecting Port Súdan and Suákin with Khartúm being publicly opened by Lord Cromer in January 1907. Port Súdan is now in a rapid state of development, and must shortly become a place of great importance.

The Sheikh's tomb is a white gabled building of cottage-like appearance, about 12 feet high, standing on an eminence 14 feet high, within 50 yards of the sea on the southern entrance point, and the land around being low, flat, and of a brownish colour, the tomb is a very conspicuous object.

Depths, &c.—The navigable channel in the entrance is from one to 1¼ cables wide with depths decreasing rapidly from 40 to 14 fathoms. At 4 cables above the Sheikh's tomb, the khor bifurcates. The western branch ending in a mud flat, at times over flowed ; the width of this branch is about 1½ cables, its length, with depths decreasing from 14 to 3½ fathoms, being less than 4 cables. The north-western arm is a narrow creek 2½ miles long, one cable wide at its entrance, and tapering off to half that width a short distance up, but with deep and clear water for 1¼ miles, the depths being from 14 fathoms at the

Plan 3492, Port Súdan. Var. 2° 50′ W.

entrance to 6 fathoms at that distance above, beyond which at least 4 fathoms may be carried nearly to the head of the creek.

The railway bridge crosses the north-western arm about 6 cables above the entrance.

The land on all sides presents the appearance of a flat desert plain with a few small elevations and occasional clumps of mimosa bushes.

Entrance.—Anchorage.- The entrance is straight in a north-westerly direction between the fringing reefs on either side, which are clearly visible and with no detached dangers. The anchorage, about half a mile in length, is abreast of the north-west arm with depths of 7 to 14 fathoms, mud and coral.

LIGHTS AND BEACONS.—On the northern side of the harbour entrance is an iron framework tower 63 feet high on the outer end of a coral pier 410 yards S. 61° E. from the Sheikh's tomb. From it is exhibited an *occulting light* with a period of *ten seconds*, visible 14 miles. The light shows *red* and *white* sectors, thus:—*red* over Wingate reef, *white* through an arc of 30° over the fairway, *red* over the Towartit reef.

On the northern side of the entrance channel, about 2 cables within the last described light and at the outer end of a short coral pier close to the Sheikh's tomb, from an iron structure is exhibited, at 26 feet above water, a *fixed green* light, visible 6 miles.

On the southern side, just within the entrance, also at the outer end of a coral pier extending to the edge of the fringing reef, from a similar iron structure, and at 26 feet above the sea, is exhibited a *fixed red* light, visible 6 miles.

Leading lights.—An iron framework tower, 113 feet high, stands on the northern shore of the western arm. A similar tower 157 feet high stands in the rear, N. 51½° W. 1,060 yards from the front tower. By night from each tower are shown two *fixed red* lights placed vertically and 20 feet apart.

These two towers therefore act as leading beacons by day and leading lights by night.

The front beacon is painted in chocolate and white horizontal bands, the rear beacon is chocolate only. They are visible from seaward through an arc of 90° and when in line bearing N. 51½° W. lead directly into the harbour.

Two beacons stand on prominent points of the reef, one on each side of the channel outside the harbour. The northern one has a triangle topmark and the southern one a black and white checkered disc topmark.

(It is intended to make these lights permanent on the completion of the quay, but as yet they are only exhibited on application to the controller of lights.)

General charts 81, 8c, and 2523.

Plan 3492, Port Súdan. Var. 2° 50′ W.

Pilotage is compulsory on all mercantile vessels above 10 tons measurement by the Suez canal scale, but there is no difficulty in entering.

Tides are scarcely perceptible, a daily rise and fall of one foot being very rare. The water level generally averages 14 inches higher in the winter than in the summer.

Chart 81, Mersa Darúr to Trinkitat.

Directions.—Approaching Port Súdan from seaward, having passed about 2 miles southward of Sanganab reef lighthouse (*see* page 176), steer to pass one mile southward of the Wingate reefs, which are steep-to on their southern and eastern faces, and there are no off-lying dangers of any kind. The lighthouse northward of N.E. ½ E. until the tomb bears westward of W. ½ S. leads clear of Saganab reef. When abreast of the small detached reef forming the south-western extreme of the Wingate reefs, with the tomb about W. ½ N., steer direct for the harbour entrance, and then with the leading beacons in line by day, or their lights by night, bearing N. 51½° W. run in and up to the anchorage already described.

Port regulations were issued on July 1st 1907; they include pilotage, tariff charges for boats, tugs, lighters, &c.

The town is being rapidly constructed of coral, and many public buildings are already completed, including the headquarter offices of the Red sea province, the customs administration, the post and telegraph departments, railway station, &c., all of which help to render the position of the place conspicuous from seaward. In 1907, the population was already nearly 5,000, of whom about 1,000 were Europeans; several piers have been built, and quays are in course of construction along the east shore of the harbour. A small garrison and police force are stationed here.

Quays.—Quays are in course of construction on the northern side of the harbour. In April 1909, five berths, 400 feet long, with a depth of 30 feet water, will be available for vessels to lie alongside.

The quays are fitted with electric cranes and capstans for handling cargo.

Supplies of most descriptions can be obtained. A coal depôt, to be finished in April 1909, is under construction.

Trade.—The principal exports in 1906 were cotton, cotton seed, senna, ghi, gum, cattle, and hides; the imports, dhurra, flour, rice, tea, cotton, Manchester goods, cement, timber, and liquors. All branches of trade were rapidly increasing.

General charts 81, 8c, and 2523.

Chart 81, Mersa Darúr to Trinkitat. Var. 2° 50′ W.

Communications.—There is weekly mail service by Khedivial line of steamships with Suez, an ample train service with the interior by the Súdan and Red sea railway, and a daily train to Suákin. Telegraphic communication is open with Suákin, and from thence, *viâ* Eastern Telegraph Company, through Aden and Suez with the general system of the world.

COAST.—From Port Súdan to Suákin the coast is quite low, being composed entirely of raised coral reef furrowed by the beds of streams which are wet only in the rainy season. The plain between the coast and the hills is dotted with low scrub and bushes about 10 feet high.

TOWARTIT REEFS.—The northern extreme of this extensive cluster marked by a beacon is situated 6½ miles south-eastward of Port Súdan entrance whence its western edge trends southward parallel to the coast, to a position 2½ miles east-north-east of Suákin; between it and the fringing shore reef is the Inner channel below mentioned.

From the Towartit beacon, the outer shoal edge of the Towartit reefs trends south-eastward for 8¾ miles, and then more southerly for 7¼ miles; here are two dangerous clusters, Heyman reef, and 3 miles southward of it, Williamson shoals, both of which seldom break. No shoals have been found southward of the Williamson shoals on the outer sides of the Towartit reefs, but vessels should not pass north-westward of a line drawn from those reefs to the known southern end of the reefs as it is all dangerous ground. Quoin hill, in line with Suákin northern entrance beacon bearing W. by S. ¼ S. leads 2½ cables southward of the reefs.

Beacon (*Lat. 19° 31′ 40″ N., Long. 37° 19′ E.*).—A white pyramidal beacon of masonry, 21 feet high, stands on the northern extreme of North Towartit reef; it is surmounted by a red staff and triangle 9 feet high, the entire beacon being 30 feet above high water.

Wrecks.—In 1907, a wreck with one mast above water was lying on the reef S. 54° E., 7 miles from the beacon; and farther southward on the inner part of the reefs abreast of Williamson shoals, in 1892, was a stranded steamer, with the fore part low in the water and the after part high and dry; this wreck was approximately in Lat. 19° 17¼′ N., Long. 37° 22¾′ E., and may have disappeared by now, though still visible in 1902.

The inner edge of the reefs extends 8 miles southward of the position of the last-named wreck and comes to an end about 2½ miles north-eastward of the outer beacon of Suákin.

General charts 81, 8c, and 2523.

Chart 81, Mersa Darúr to Trinkitat. Var. 2° 50′ W.

Anchorages.—There are several breaks in the coast reef in the inner channel, described above, between Port Súdan and Suákin, giving shelter to boats and dhows as follows:—

Mersa Amid, 11½ miles from Port Súdan, its position marked by Mangrove island, inside the coast reef, covered with bush, and 7 or 8 cables northward of it.

Mersa Atá, 19 miles southward of Port Súdan, marked by a wooded islet which may be seen many miles distant, and off which the soundings are irregular for about 2 cables.

Shab Damath, 3½ miles southward of Mersa Atá, is a projecting horn of reef, inside of which is Mersa Kuwai, larger than the others and having irregular soundings.

There is room further southward in Mersa Kuwai for three or four vessels of moderate size; but the southern end of Shab Damath does not show well: it should, therefore, be buoyed before entering. At 2 miles northward of Suákin there is also a small break in the reef.

The fringing coast reefs project somewhat seaward at Towartit elbow (*Lat. 19° 29′ N., Long. 37° 18′ E.*), 21 miles northward of Suákin; here it narrows the channel between the fringing reef and the off-lying reefs to 1½ miles.

Beacon.—From thence to Suákin, the edge of the fringing reef is well marked, except at Hadarawip spit, known to the natives and pilots as Ras Abdallah, 7 miles southward of Towartit elbow, where a 2¼-fathoms patch, marked by a beacon, lies nearly a mile from the shore; and at Shab Damath, where the projecting horn, forming Mersa Kuwai, which does not always break.

MOUNTAINS.—General Aspect.—As already stated, the general appearance of the coast in this vicinity is that of a sea-board about 2 feet high backed by a wide plain, in winter dotted with small shrubs and grass tufts, but otherwise of a brown desert-like appearance; this plain, though flat and level in appearance, is not actually so, but rises gently towards the mountains 10 or 20 miles inland, become slightly undulating, and is intersected by many dry khors or torrent beds.

The mountainous interior rises abruptly from the plain in a well-defined line of foothills from 300 to 400 feet high, with mountain masses from 4,000 to 7,000 feet high in the rear, the summits being about 25 miles inland. From the sea, all appears barren and brown, but it is reported that there are many green spots and perennial streams among the mountains.

During winter, the mountains are frequently hidden for long periods by haze or rain clouds, but amongst the foothills are several summits seldom hidden, and useful for fixing a ship's position.

General charts 81, 8c, and 2523.

Chart 81, Mersa Darúr to Trinkitat. Var. 2° 50′ W.

Of the mountains, the most remarkable is Jebel Gomadliab, described on page 169, with the mountains northward of it. To the southward is the great Bawati range extending some 16 miles in a south-south-east direction and having six summits, of which five are between 5,000 and 6,000 feet high. Southward of Bawati, the inland ranges decrease in height until southward of the parallel of Port Súdan, when Jebel Sótriba (*Lat. 19° 35′ N., Long. 36° 54′ E.*) rises to a height of 4,481 feet in a not very well-defined summit. This mountain, facing as it does the fairway to Port Súdan, which is also the usual approach to the channel for Suákin, is a valuable landmark when not hidden by clouds.

Of the lower ranges and hills nearer the coast, the next southward of the unnamed hill 1,157 feet high, mentioned in connection with Mersa Fejer, are the Paps or Jebel Tagwini; the two summits of this hill are each about 1,200 feet high, and have nearly the same appearance from all directions except when in line on a S. 80° W. bearing.

Jebel Deani, 4 miles south-westward from the Paps and the peak of Adalueb, 2,254 feet high and 5 miles southward of the latter, are both conspicuous, as is also a long unnamed hog-backed range 2,431 feet high, trending in an easterly direction towards Port Súdan, so that from that place it shows as a single peak.

Hadarawip hill (*Lat. 19° 21′ N., Long. 37° 8½′ E.*) is one of a comparatively low group of irregular hills nearing the shore half way between Suákin and Port Súdan. From the northward, the central peak, 1,607 feet high, appearing sharp on every bearing, becomes useful for ascertaining a ship's position. The next hill westward is Hadarawip hill, and from the southward this shows as a blunt cone.

Railway.—The Nile and Red sea railway approaches the coast through the valley between the Hadarawip hills in the south and the ranges of Jebel Kwish and Sótriba in the north. When about 10 miles from the coast, one branch leaves the main line to Port Súdan and turns off southward to Suákin.

Waratab, 2,056 feet high, is the highland just northward of the parallel of Suákin. It is the highest and most prominent conical hill in this part, and the top is broken into two small knobs. At a distance, its aspect is that of a truncated cone or volcanic summit, and it has this appearance on every bearing except from south-west to west-south-west when it is almost sharp. This peak and Hadarawip sharp peak are most useful for bearings.

General charts 81 and 2523.

Chart 81, Mersa Darúr to Trinkitat. Var. 2° 50′ W.

North-westward of Waratab is a rounded peak with a long serrated shoulder; under this peak, when viewed from the north-eastward, a remarkable shining quartz patch is frequently visible. The village of Handub, through which passes the road to Berber, is 3 miles northward of Waratab.

Southward of Waratab, the higher ranges trend inland, but two conspicuous saddle-shaped hills stand well to the front. Of these, the North saddle is frequently difficult to see on account of its colour. The South saddle loses its shape when bearing northward of west-by-north. Quoin hill, small, wedged-shaped, and 828 feet high, lies north-eastward of the North saddle; it is the nearest hill to the coast and a useful landmark.

Inner channel to Suakin.—About 1½ miles westward of Towartit beacon is the fairway of the inner channel southward to Suakin. The Towartit reef on its eastern side, with the exception of those at the southern end, show in a moderate breeze. The most dangerous is a narrow detached reef one mile south-westward from the beacon, and about 3 cables westward of the western edge of the group.

From abreast Towartit beacon to the entrance of Suákin, a distance of 23 miles, the general direction of the Inner channel is southerly and its navigable width from one mile to 1½ miles, though at places it is as much as 3 miles wide. The best track is marked by a pecked line on the chart.

Chart 81, Mersa Darúr to Trinkitat.

Outlying reefs.—The Towartit reef, on the northern side of the approach, has been described on page 180.

APPROACHES TO SUÁKIN.—Suákin is approached by either of three principal routes according to the direction from whence a vessel is coming:—viz., the Northern, North-eastern, and Southern approaches.

The first or northern leads in from the open sea to the Inner channel from Port Súdan, westward of Towartit reef.

The second, or north-eastern, enters just northward of Hind Kádam islet, of the Suákin group, and is that which should be taken by large vessels; and the third, or southern, leads up by the southern Inner channel, passing inside or westward of Tella-tella Seghir island, also of the Suákin group, and commonly it is the route followed by vessels from the northward, especially since the establishment of the Sanganeb light.

General charts 8c, 8d, and 2523.

Chart 81, Mersa Darúr to Trinkitat. Var. 2° 50′ W.

The Suákin group of outlying reefs, shoals, and islets, fronts the coast from Suákin to Nowarat, extending from the North Jumna reef, in lat. 19° 27′ N., long. 37° 43′ E., to Dahret Abid island, in lat. 18° 21′ N., long. 38° 46′ E., a distance of nearly 90 miles in a south-easterly direction; some of the reefs lying as much as 15 miles outside or north-eastward of this line, and nearly 40 miles from the nearest part of the mainland. They extend over an area about 25 miles wide; their inner boundary, where there are many sunken rocks and very deep channels, being generally about 10 miles from the shore. The various islets and shoals of this group, in so far as they affect navigation, that is those bordering the eastern and southern passages to Suakin, and, therefore, of interest to the mariner, are described in their natural order in the following pages. The remainder of the eastern portion will be found on page 206.

NORTH-EASTERN APPROACH.—Except in the early morning, when the sun is in the most favourable position, this approach to Suákin is said to be somewhat difficult, owing to the hills and landmarks being generally obscured by mist, especially in summer; the reefs also are not so easily distinguished during this season, owing to the prevailing calms. But having made Hind Kadam, the pecked line on the chart is apparently easily followed. Shab Anber breaks occasionally and Shab Jusser, which always breaks, will be good marks. It seems preferable to large vessels to either of the others. This channel is sometimes preferred by vessels leaving Suákin late in the afternoon, when, if the South Jumna shoal can be cleared before dark, a course can be shaped to the open sea.

The following islands and reefs bordering the southern side of the channel:—

Hind Kadám (*Lat. 19° 23′ N., Long. 37° 54′ E.*).—**Beacon.**—This, the northernmost islet of the Suákin group is on the southern side of the north-eastern fairway. It is small, topped with bush 15 feet above the sea, and is visible 7 or 8 miles distant. The islet is encircled by a reef extending one cable northward of it, steep-to, and affording no anchorage. A beacon stands on Hind Kadám, consisting of a black iron frame, surmounted by a cage-work ball, standing on a white pyramidal masonry base. The beacon is 40 feet in height, the summit being 55 feet above high water, and is visible about 12 miles distant. *See* sketch on Chart 81.

Hind Kadám is visited in the season by turtle catchers.

General charts 8c and 2523.

Chart 81, Mersa Darúr to Trinkitat. Var. 2° 50′ W.

Reefs.—Peshwa reefs, of small extent, on which the sea generally breaks, lies E. by S. ¼ S. 5¼ miles from Hind Kadám; about midway and in line between them is a small rocky patch.

Another rocky patch, 3 cables in extent, lies W. by S. ½ S. 4 miles from Hind Kadám; this patch is steep-to and breaks in a moderate swell.

Keary reef is a small patch which sometimes breaks, lying S.W. ¾ W. 6 miles from Hind Kadám; another reef lies S.S.E. ¾ E. 4½ miles from that island.

Seil Addar, in the charts published in 1841, was shown as a small sand and coral island, steep-to, and lying about 4 miles S. by W. ½ W. from Hind Kadám, with a rocky patch about 2 miles E. by N. ½ N. from it. Nothing was seen of this island by H.M.S. *Myrmidon* when examining the neighbourhood in 1884; it is possible that the sand may have been washed away, leaving a submerged shoal.

Shab Anber is a narrow reef, about 5 miles in length with gaps in places; it breaks generally at the northern end. This extreme lies 12 miles W. by S. ½ S. from Hind Kadám. Nearly in the middle, on its western edge, is a coral head, 5 feet high and another head 3 feet high lies 1¼ miles northward of it.

Shab Mobiyet is a narrow shoal, partly submerged, with alternate deep and shoal water throughout its length, about 2½ miles. The northern end, nearly awash, bears S.S.W. ½ W. 2¾ miles from the rock 5 feet high on Shab Anber. A reef of circular shape and 5 cables in diameter, which shows light green, lies about one mile south-eastward of Shab Mobiyet.

Shab Gusser (*Lat. 19° 11′ N., Long. 37° 36′ E.*) is about 5 cables in extent, with a few coral heads showing on which the sea always breaks. It lies 9½ miles south-westward from the northern end of Shab Anber.

At 1⅓ miles eastward from Shab Gusser in Myrmidon pinnacle, a steep-sided 3-fathoms patch, 40 feet in extent.

Shab Tuil, its western end 1½ miles southward of Shab Gusser, trends eastward from thence more than one mile and is 5 cables wide; a shoal spit extends 2 miles from its southern side. The reef generally breaks; there is however but little indication of the spit, which is a source of danger to coasters approaching from the eastward.

The passage between Gusser and Tuíl appears to be clear.

General charts 81, 8c, and 2523.

Chart 81, Mersa Darúr to Trinkitat. Var 2° 50′ W.

Burns, Entrance, and Cunningham reefs.—This long group of coral heads, commencing 5 miles south-westward from Shab Gusser, extends in a westerly direction to within 2 miles of the coast reef. Entrance reef, a patch, one-third from the western end of these reefs, generally breaks and lies east-south-east 5¼ miles from Suákin entrance. Cunningham shoal, of less than one fathom, is at the north-western corner of this string of reefs, one mile westward from Entrance reef, with which it is almost connected by a narrow tongue, sometimes visible as a blue line in the water.

The western end of these reefs forms the north-western extreme of the Etwid group of reefs.

Caution.—South-westward of Shab Tuíl, and extending to the Kad Etwid reefs, is a dangerous area only partially examined, and in which are many reefs. No vessel should attempt to pass through it.

The following reefs border the northern side of the fairway :—

North Jumna shoal (*Lat. 19° 27′ N., Long. 37° 13′ E.*), 11 miles W.N.W. from Hind Kadám, on the opposite side of the track, is a coral reef awash, 2 cables in extent, and steep-to, and, in a calm, a few heads of dead coral show above water.

South Jumna shoal.—Buoy (*Lat. 19° 11½′ N., Long. 37° 31′ E.*).—This dangerous shoal, lying just northward of the fairway of the North-eastern approach, was discovered in 1884 by H.M.S. *Jumna;* the sea only breaks on it with a heavy swell. It has shoal heads of from 1½ to 2½ fathoms extending over a distance of 9 cables, and a 5-fathoms patch about 4 cables eastward of the southern part of these shoal heads; its south-eastern end is prolonged by a bank with from 8 to 12 fathoms, from which irregular broken ground extends eastward 2¼ miles with depths of from 17 to 60 fathoms.

A buoy, with quadrangle and iron staff in the centre, painted red, the staff surmounted by a white wooden ball, standing about 15 feet above the sea, is moored on the south-western side of the centre of the shoal patches at about 7 cables south-eastward of the westernmost patch. Dependence should not be placed on this buoy being in position.

The channel beween the South Jumna shoal and Shab Gusser and Burns reef on the opposite side is fully 3 miles wide.

Discoloured water has been reported at 6 miles north-eastward from the South Jumna shoal.

General charts 8c and 2523.

Chart 81, Mersa Darûr to Trinkitat. Var. 2° 50′ W.

Directions.—In steering for Suákin by the North-eastern approach, the route indicated on chart 81 is that which should be followed. Thus, having sighted Hind Kadám, 15 feet high, a course should be shaped to pass 1¾ miles northward of that island; from thence, a run of 12 miles leads to a position about 21¼ miles northward of Shab Anber, the north point of which usually breaks. Then steer more southerly for about 14 miles to pass between Shab Gusser, which breaks, and the eastern tail of the South Jumna shoal; when 2 miles past Shab Gusser, or 2 miles westward of Shab Tuíl, a straight course may be shaped for the entrance of the harbour, which should then bear W. ¼ S. about 11½ miles distant. Keep a good look out on the starboard hand for the Towartit reefs, and, to avoid them, keep Quoin hill open southward of Suákin North entrance beacon.

For entering the harbour, *see* page 194.

Chart 8c, Red Sea, Sheet IV. and 81, Mersa Darúr to Trinkitat.

INNER CHANNEL TO SUÁKIN.—SOUTHERN APPROACH.—The aspect of the coast southward of Suákin is high and mountainous in the interior with the hills farther inland and low northward of Suákin, for which *see* the charts. There are several long islets covered with mangrove bushes and scrub along the shore, which, except when seen from aloft, cannot be distinguished as islands, the shore presenting an apparently unbroken coast-line. The fringing shore reef can generally be seen; it is broken in several places, thus forming natural boat harbours.

From outside Shab-ul-Shubuk, nothing is ever seen of the coast between Mersa Sheikh Sad and Ras Makdah.

The mountain range approaches the coast at 27 miles southward of Suákin, and then trends south-westward inland, leaving a wide plain on which Jebel Shabab stands alone. The dust and mirage on this part of the coast frequently obscure it altogether.

The channel between Karb island and Ras Shakal, at Khor Nowarat on the main, is about 12 miles wide. Between Dakret Abid, the outermost islet in the approach and the southernmost of the Sawakin group, it is 20 miles wide. The descriptions of the coast at the entrance of these channels will be found on page 184.

The following are the islands and reefs passed when entering by the Southern approach.

Dahret Abid island (*Lat. 18° 21′ N., Long. 38° 46′ E.*) is the southernmost of the Suákin group, lying 20 miles north-

Chart 81, Mersa Darúr to Trinkitat. Var. 2° 50′ W.

eastward from point Abu Yabis, on the mainland, and 15 miles east-south-east from Abu Marina.

These last-named nine islands at the south-eastern corner of the Suákin group are all low, consisting of coral and sand, from one to 5 cables in diameter, with a few bushes growing on them, and with deep water amongst and between them.

Akrab and Karb islands rise from a dangerous coral reef, 7 miles in length, north and south, by 5½ miles in width, including patches in its neighbourhood. There are on this reef six small islands, or, more correctly, sand and coral banks, on which, when there is any swell, the sea breaks heavily. The three northernmost are called the Akrab islands; the two next, southward of them, the Karb islands; and the easternmost, Abu Marina island (*Lat. 18° 26′ N., Long. 38° 32′ E.*). The water is very shoal in parts on this reef, caused by pinnacle coral rocks with no bottom, at 40 fathoms, between them, as also close westward of Karb island. The northern Akrab island is 13½ miles north-eastward from Ras Shakal on the mainland.

Shoals.—About 4 miles southward of the Karb islands, and from 6 to 10 miles eastward of Ras Shakal, is a rocky bank of from 7 to 16 fathoms, with 40 fathoms between it and the shore; and 3 or 4 miles farther in the same direction and 5 miles southward from Abu Marina, is a bank with from 5 to 10 fathoms, probably an extension of the Akrab reefs, and no bottom very close-to with 30 and 40 fathoms.

Chart 8d, Red Sea, Sheet IV.

Dara-ah-Teras is a low sandy coral island, about 14 miles S.E. ½ E. from Tella-tella Seghir, and N.N.E. ½ E. 12 miles from Ras Asis on the mainland; it has depths of 23 fathoms close to, and 18 fathoms midway between it and the mainland. A reef extends about a mile eastward of Dar-ah-Teras.

About 6 miles east-south-eastward from Dar-ah-Teras a dangerous reef has long been said to exist, which later reports place only 3 miles from Dar-ah-Teras; the locality has not been examined and should be given a berth; it is north of the fairway.

Tella-tella Seghir (*Western end, Lat. 18° 46′ N., Long. 38° 0′ E.*) is an island consisting of raised coral, cliffy on the south-west, but sandy and sloping on its north-eastern side. It is about 1½ miles long east and west, and has a narrow fringing reef on its southern shore and eastern end; shoal water apparently extends from 5 to 8 cables from its western and northern coasts. The ridge of the island, about 40 feet above the sea, is quite bare, and has several cairns on it.

General charts 81, 8c, and 2523.

Chart 81, Mersa Darúr to Trinkitat. Var. 2° 50′ W.

Anchorage may be had in from 17 to 20 fathoms, mud, off the south-eastern extreme of the island; or in 9½ fathoms, good holding-ground, under the southern side, less than 2 cables from the fringing reef.

In 1886, H.M.S. *Dolphin* searched for the 5-fathoms patch shown on the chart 2 miles southward of Tella-tella Seghir, but could find nothing less than 16 and 17 fathoms in the neighbourhood.

Chart 8c, Red Sea, Sheet II.

Météore patch.—A patch of 7 fathoms, in lat. 18° 39′ N., long. 38° 2′ E., was sounded on by the French vessel *Météore* in 1888. It lies in the fairway southward of Talla Seghir.

Plan 1948, Mersa Makdah.

Melita patch is a circular sand and coral shoal, about 2 cables in diameter, having on it a least depth of 4¼ fathoms, and from 6 to 8 fathoms northward and southward of it. The patch lies with the beacon on the south-eastern point of Ul Shubuk bearing S.S.W. ¼ W. distant 1 2/10 miles, and Round islet W. by S. ½ S.

Kad Hogít.—Beacon.—This reef lies 16 miles westward of Tella-tella Seghir, is in three parts, 1½ miles in extent east and west, and partly submerged. The eastern portion is generally visible; the western portion seldom, unless a swell is running, when it breaks. Near the centre is a small coral head, on which stands a white conical stone beacon 25 feet high above sea level, and surmounted by a staff and ball. A sand-bank 2 feet high sometimes forms around this beacon.

The eastern part of the reef is generally visible; the western portion seldom, unless a swell is on, when it breaks. Vessels proceeding eastward of the reef should not pass within 8 cables of the beacon.

Southward of the reef there is anchorage in 10 fathoms, mud, with protection from all except south-easterly winds, the beacon bearing N.N.E. 4 cables.

Cygnet patch (*Lat. 18° 46′ N., Long. 37° 46′ E.*), about 5 cables eastward of Melita patch, is a narrow sand and coral shoal about 2½ cables long east and west, with a least depth of 4¼ fathoms at its western end. Several heads of 5 fathoms lie within a distance of 2 miles northward and north-eastward of it. Caution is therefore requisite when navigating in this locality.

General charts 81, 8c, and 2523.

Plan 1948, Mersa Makdah. Var. 2° 50′ W.

Shab-ul-Shubuk is a large shoal entirely filling up the bight north-westward of Ras Makdah for a distance of 17 miles, and extending as much as 10 miles off-shore; the eastern edge is generally visible, but the northern edge is much broken and submerged, and should be given a wide berth. Between its western edge and the shore is an intricate deep-water channel with many shoal heads; it was navigated by the eye by H.M.S. *Condor* in 1885, that vessel entering it from the northward close to Mersa Sheikh Sad and keeping the shore reef aboard, but it is not recommended, and as the passage outside the reef is of no greater length, there is nothing gained by using it.

Beacon.—A reef 6 cables long north and south, and 3½ cables wide, having a small sand cay one foot high near its centre, is at the south-eastern extreme of Shab-ul-Shubuk, and is separated from the main body of the reef by a 9-fathoms passage one cable wide; it may be passed on the eastern side about 3 cables distant. The south-eastern point of this reef is marked by a stone beacon; at 8½ cables N.W. by W. ¼ W. from the sand cay is Round island, 9 feet high, near the outer edge of Ul-Shubuk.

The eastern edge of Ul-Shubuk trends north-westward, 13½ miles to the northern extreme of Corner reef, and then westward 7½ miles to within 2 miles of the shore. A break in the reef about 5 miles from the south-eastern extreme leads to Sumar inlet, which connects with the inner passages and affords anchorage in from 6 to 9 fathoms. Gap islet, 8 feet high, near the edge of the reef, marks the western side of the entrance to Sumar inlet, off which lies a bank with from 4½ to 5 fathoms. The entrance is further marked by a small beacon on either side.

Chart 81, Mersa Darúr to Trinkitat.

Corner reef.—**Beacon.**—At the north-eastern corner of Ul-Shubuk, where the edge of the main reef bends round westward, are two small detached reefs; Corner reef, the outer one, is crescent-shaped, 1½ miles from the main reef, and marked near its centre by a white masonry pillar beacon, surmounted by a staff and cage, standing about 20 feet above the sea. Shoal water of from 3½ to 5 fathoms exists 1¾ miles north-westward from Corner reef, to which a wide berth should be given. Corner reef breaks in all weathers except a calm, and is even then generally visible.

Two-islet reef (*Lat. 18° 53′ N., Long. 37° 45′ E.*) on the east side of the track is a double reef with an islet on each part, the two reefs being separated by a narrow streak of deep

Chart 81, Mersa Darúr to Trinkitat. Var. 2° 50′ W.

water. The north-eastern and larger islet, 11 feet high, lies 5¼ miles north-eastward from Kad Hogít, and has a growth of stunted bushes amongst which numerous sea birds build their nests. This islet forms a useful mark in clearing the shoals northward of Ul-Shubuk; the smaller islet is 5 feet high. The reefs on which they lie extend 8 cables south-eastward, and nearly as far northward from the islets.

Green reef is so named from its bright green colour when the sun is high; the southern extreme is 2½ miles north-westward from the larger islet of Two-islet reef. Green reef is 3½ miles long north and south, and 1½ miles wide; the northern and western sides are awash, but the eastern and south-eastern sides are submerged. From 18 to 20 fathoms are found off its western side, but northward of the reef the soundings are irregular.

A coral shoal, with a depth of 2½ fathoms on it, and from 5 to 7 fathoms around, lies 2 miles north-north-east from Green reef. There are many reefs north-eastward of it, for which *see* chart.

Middle shoal.—Buoy (*Lat. 18° 55½′ N. Long. 37° 32′ E*). —The Middle shoal with 2½ fathoms is a coral head lying 2¾ miles northward of the northern edge of Shab-ul-Shubuk. It is marked by a can buoy, painted red and white in horizontal stripes, and surmounted by a staff and white disc; but the fairway lies northward of it. The buoy, however, like other buoys or beacons in this vicinity, is very liable to be washed away.

Kad Etwid reefs.—At 7¾ miles N.W. by W. ¼ W. from Corner reef of Ul-Shubuk, a small reef will generally be seen breaking. This is the South-east reef of the Kad Etwid group, and a spit with irregular soundings projects south-south-east one mile from it. From this, the southern boundary of the cluster trends north-westward to the South-west islet of the group, a sandy islet 6 feet high, with bushes on it, lying 1½ miles off the fringing shore reef, and on the opposite side of the track; the islet is surrounded by a reef nearly 2 cables wide, with deep water 1½ cables westward of it.

A shoal 3 cables in extent, with 4 fathoms water, lies 1½ miles S. by E. ½ E. from the South-west islet.

From South-west islet, the inner edge of the reef trends north-eastward for 3 miles, and then north-north-west 5¼ miles until within about one mile of Cunningham shoal, described at page 186. Several shoals lie westward of the breaking reefs, but none within a mile of the shore reef, except a 4-fathoms

Chart 81, Mersa Darúr to Trinkitat. Var. 2° 50′ W.

patch, 1½ miles northward of South-west islet. There are three other islets on this reef, one, a sandy islet 8 feet high with bushes, similar to South-west islet, and 1¼ miles north-eastward of it.

There is no navigable passage through the Kad Etwid reefs.

Channel between Shab ul-Shubuk and Kad Etwid.—The channel between these reefs is nearly 3½ miles wide, but it is encumbered by many patches with from 4 to 7 fathoms. Besides the shoals already mentioned southward of South-west islet, there exist two coral heads of 2½ and 3½ fathoms, bearing S.E. by E. ¾ E., 6 miles and 9 miles respectively distant from it. The nearest is the Middle shoal and the other is that already mentioned at page 191 as lying north-westward 1¾ miles from the Corner reef.

Etwid islet (*Lat. 19° 1′ N., Long. 37° 33′ E.*) is sandy, 9 feet high, has bush at its north-eastern end, and is encircled by a reef; it is visible from the southern approach and is useful for fixing a ship's position. Shoal water lies northward of it; a breaking reef bears east-south-east 1¼ miles from it, and two more, which also break, lie 4½ miles east by north from the islet.

Vessels should not attempt to pass between Etwid islet and the South-east reef of the Kad Etwid reefs.

CAUTION.—Currents.—The currents in the southern approach to Suakin are extremely variable and sometimes strong. Lieut. C. G. S. Feles, of H.M.S. *Dolphin*, reported that in February 1887, from a fixed position off Deresa cove, at 6 p.m. on the 17th, courses were shaped to place the ship 10 miles N.N.E. ¾ E. from Ras Kasar, shortly after daylight of the following morning, at which time, however, Abu Marina and the Karb islands were made on the port bow, the ship having been set N.N.W. ¼ W. 19 miles in 12 hours, and there was reason to believe that the greater part of the set occurred as the islands were approached.

Charts 81, Mersa Darúr to Trinkitat, and 8d, Red Sea, Sheet IV.

Directions.—Southern approach to Suákin.—When approaching the entrance to the southern channel for Suákin, inside the Suákin group, great care is necessary as the currents are strong and very irregular; the approach should be so timed as to make sure of having broad daylight before any of the islands or shoals are neared, unless trustworthy astronomical observations have been obtained through the night.

Black hill standing in the foreground of the mountains, westward of this channel, will, with Jebel Waratab, be found useful for bearings.

General charts 81, 8c, and 2523.

Charts 81, Mersa Darúr to Trinkitat, and 8d, Red Sea, Sheet IV. Var. 2° 50′ W.

When in the fairway between Karb island and Ras Shakal, a vessel will be 3 miles from both, whence course should be shaped to pass a little southward of Météore bank of 7 fathoms, thence in fairway westward of Tella-tella island.

From Tella-tella Seghir island or from south-eastward, pass about 3 cables north-eastward of the reef at the south-eastern end of Ul-Shubuk, marked by a beacon on its south-eastern corner; then, following the track indicated by a pecked line on charts 81 and 8c, the courses will be about N.W. by W. for 3¾ miles, or until Kad Hogít beacon bears N.N.E.; then, about N.N.W. ¼ W. for 9¾ miles, and when Corner reef beacon bears S. by W. about 2½ miles, the course should be altered to about W. ½ N. to pass northward of the Middle shoal buoy and southward of the South-east reef of the Kad Etwid group.

Skirting the latter reef, which almost always breaks, at a distance of one mile, to avoid the spit extending southward of it, a westerly course carries a vessel towards the shore fringing reef southward of a 4-fathom patch which may then be followed all the way to Suákin, keeping it at a distance of about 4 cables.

Directions for entering the harbour, *see* page 194.

Plan 901, Suákin harbour.

SUAKIN HARBOUR (*Observation spot, Lat. 19° 6′ 58″ N., Long. 27° 20′ E.*).—The khor or inlet of Suákin, is bordered by reefs on either side, and the entrance channel, though somewhat tortuous, takes a general south-westerly direction, its length up to Quarantine island being 2 miles, and its width at the narrowest part 180 yards. The bordering reefs are covered in December, but dry from May to August. The shores are about 5 feet high and of gravelly appearance.

The best approach is by the north-eastern passage (page 184), which is marked by beacons and islets, and is fairly easy. It should always be used by large vessels.

Entrance - Beacons.—The channel is marked by five substantial white stone beacons, built and maintained by the Súdan government; three stand on the starboard hand in entering, are painted white and numbered, commencing at the outer beacon, Nos. 1, 3, and 5; two are on the port hand, are painted in black and white checquers, and are numbered 2 and 4. All the beacons stand on the edges of the bordering reefs, the two outer beacons bearing from each other N. ¾ W. and S. ¾ E. and being 4 cables apart. (*See* sketch of beacon on chart 901.)

General charts 8c and 2523.

Plan 901, Suákin harbour. Var. 2° 50′ W.

Depths.—In the entrance of the khor the depth is 25 fathoms, gradually decreasing towards Quarantine island, outside the fringing reef of which there are from 6 to 8 fathoms, with considerable space for anchoring. The bottom throughout the channel is mud.

Directions.—No pilots for Suákin are to be obtained; but the port is under the control and regulations of the Súdan government under whom an official termed a berthing master, meets all vessels expected and conducts them to their assigned berths.

In entering the channel, the eye is the best guide, the beacons being good and substantial, the reef bordering the khor easily seen. The channel is open when Waratab hill bears W. $\frac{1}{8}$ N. The Caravanserai, a square stone building, a tall minaret westward of it, and the dome-shaped mosque Abdullah, are conspicuous objects to those approaching. The massive stone chimney and high iron funnel of the condensing apparatus on Quarantine island can be seen 12 miles distant.

From a position eastward of the North entrance beacon, the dome of the mosque Abdullah bearing S.W. $\frac{1}{4}$ S. is in line with Graham point, the southern entrance point of the harbour, and this line leads nearly up to the second beacon on the starboard hand, but by the time the first beacon on the port hand is abeam, the channel can be clearly seen. Give the first beacon on the port hand a berth of $1\frac{1}{2}$ cables in rounding the northern end of the reef on which it stands. The turning at the second beacon on the port hand is sharp, but the beacon may be passed at half a cable. On the northern entrance point is a yellow mound with a tomb behind it; after passing it the course up the harbour is fairly direct, and, if not boarded by the berthing master, be guided as to anchoring by the remarks already given.

Tides.—In Suákin harbour there are single day tides, or one high and one low water a day. The rise and fall, at springs, being only about 18 inches, and much influenced by winds and other causes. The total rise and fall from a low summer tide to a high winter tide is 3 feet, as the mean winter level is 18 inches higher than the mean summer level. During the fortnight from full moon to change, or from change to full moon, the level of the water rises a foot for the first seven days, and falls a foot for the next seven, the lowest water occurring at about full and change, the diurnal rise and fall continuing all through.

It is high water at full and change at 1h. approximately.

General charts 81, 8c, and 2523.

Plan 901, Suákin harbour. Var. 2° 50′ W.

Mooring buoys.—There are four mooring buoys in the harbour; the upper one in the North-west arm belongs to the government. Two are owned by the Khedivial Mail Steamship Company, and one off the North-eastern point of Quarantine island belongs to the Bombay and Persian Steamship Company.

Beacons. — Well up the harbour, opposite Quarantine island, are two red staff-and-triangle beacons marking the edge of the fringing reef. This edge is also marked by two small landing piers or causeways across the reef and ending at its very extreme, where deep water commences.

Anchorage. — The harbour will accommodate about 20 vessels without blocking the channel; though as many as 34 vessels, men-of-war and transports were berthed in the harbour at one time during the expedition of 1884. Merchant vessels anchor in the main channel, immediately north-eastward of the town, and secure their sterns to bollards on the jetties. Vessels of war anchor in the North-west arm north-eastward and northward of Quarantine island, with a stern hawser to that island or else to an anchor or post on the northern shore; the holding-ground is not good in this arm, and its western part is obstructed by the Myrmidon shoal, having only 8 feet water.

There is room for one vessel in the inlet south-eastward of the town, where there are depths of from 2¼ to 4 fathoms, but the channel in is very narrow, and only suitable for small vessels.

When lying at Suákin during the winter months, it is advisable to moor and to have the stern well secured, as sharp night squalls from the mountains, accompanied by heavy rain are not uncommon.

The North-west arm is about 8 cables in length, half that distance being in a west-north-west direction, the remainder turning to the northward. In the outer part the depths are 7 and 8 fathoms, and, in this part are one or two mooring buoys off Quarantine island. Farther up, as the arm turns northward, it is obstructed by the Myrmidon shoal of 8 feet, and by other large shallow patches. There is, however, a narrow 4-fathoms channel up to within 2 cables of the head of this arm.

The South-west arm, at 3½ cables within its entrance is again divided by Suákin island on which the town stands. Up to the town the channel is half a cable wide with depths of from 6 to 8 fathoms. Northward of the town is a space of the same width with from 4 to 5 fathoms; a narrow channel with a

General charts 81, 8c, and 2523.

Plan 901, Suákin harbour. Var. 2° 50′ W.

least depth of 2½ fathoms passes along its eastern side, opening out into a considerable but shallow basin southward of the town with, however, from 4½ to 4 fathoms in parts.

TOWN.—Suákin is built of coral and completely covers the small island of that name. The houses are well built after the Arab style, and lofty. The island is connected by a causeway with its suburbs, El-Kaff, on the mainland. El-Kaff is much larger than Suákin, and the dwellings are of a lighter structure, consisting mainly of grass huts surrounded by compounds; it has a very fairly supplied bazaar. In 1905, the settled population of the province of Suákin amounted to 16,809 persons, of whom 548 were Europeans; the Nomadic tribes of the province are estimated at 50,000. In that year, the town had a population of 6,592, of whom 164 were Europeans.

Piers.—On the port hand in entering are three piers in connection with the railway, Suákin having been the original terminus of the railway and the port at which all the railway material and plant was landed. The outer pier is the smallest, but steam vessels of large size can lie alongside the pontoons of the second; the inner pier is also available for large vessels.

The pumping station, with a tall iron chimney, the railway offices and the R.E. officers' quarters are conspicuous objects on the southern side of the harbour.

Quarantine.—The quarantine establishment is on the northern side of the entrance nearly opposite the piers just described; with a pier also leading to it across the reef on that side; on this pier is a small black shed used for fumigating purposes. The buildings, offices, and premises of the establishment are surrounded by high wire fencing.

The regulations as to quarantine are decided by the International Sanatory Commission at Alexandria.

Next to the quarantine station, but higher up on the same side of the harbour, is the Christian cemetery, also enclosed with wire fencing. A pier across this reef leads to it; and the enclosure is entered through a high and conspicuous stone gateway.

Quarantine island, no longer used as a quarantine station, is 2 miles within the entrance, and, fronting the the channel, divides it into the North-west and South-west arms. The island has several piers, all of which, with the exception of the Water pier, the Ferry pier, and No. 2 pier, are in a state of decay; a small steam vessel can lie alongside of No. 2 pier. Quarantine island is connected with the mainland on its western side by a causeway.

General charts 81, 8c, and 2523.

Plan 901, Suákin harbour. Var. 2′ 50° W.

Coal and supplies.—Coal in moderate quantities can sometimes be obtained, but at a high price, and there being any in stock should not be depended on; it is put on board by lighters, and the harbour being landlocked, coaling is never impeded by weather. Beef, mutton, and other sorts of provisions may be obtained; the market price of meat is 5 piastres per oke, equal to about fourpence per lb. Vegetables are very scarce, being brought up from Suez, except in the winter months. Fish are plentiful and moderate in price.

Water.—There are two modes of supply at Suákin; one by means of a condensing apparatus on Quarantine island, the other by a line of pipes from the Government waterworks in the Shata gardens about one mile from the town. Water is also brought in from wells in that locality by natives on donkeys. Water is supplied to shipping from the government works at 25 piastres (5*s.* 1½*d.*) per ton. Ice is almost always procurable.

There are no facilities for repairs of any sort for shipping.

Hospitals.—Suákin has two hospitals, one civil, the other one military, and both native; admission can be obtained to them subject to payment.

Communication.—Suákin is in communication with Port Súdan and the Súdan country by means of a branch railway line connecting with the Súdan and Red sea railway which has its terminus at Port Súdan. It has fortnightly communication by steamers of the Khedivial Mail Line; the itinerary being Suez, Jidda, Suákin, Massawa, Hodeida, Aden. Mails also arrive overland, by river and rail, from Cairo and Khartúm.

Telegraph.—Suákin is connected by Eastern telegraph cable with Aden, Suez, Perim and Obokh, and by Ottoman cable with Jidda. The cables lie along the reef on the southern side of the harbour, the whole distance until abreast of the town, when they cross the southern branch of the South-west arm directly into the Telegraph station. Communication by land lines is established with Port Súdan through Berber with Alexandria and Khartúm; also with Tokar and Kassala, and thence with Massawa and Suk-abu-sin.

Trade.—The principal exports consist of cotton, ghi, sheep, gum, mother-of-pearl, &c. The imports are mainly cotton goods, coal for railways, flour and other provisions, petroleum, &c. In 1906, the total value of the imports was

Plan 901, Suákin harbour. Var. 2° 50′ W.

324,000*l.*, and of the exports 113,000*l.* In the same year nearly 150 steam vessels brought cargo, chiefly coal and railway iron; it is probable that as the wharfage at Port Súdan increases the trade of Suákin will tend to decrease. A considerable coasting trade is carried on by small coasting vessels.

Winds and weather.—The general winds are either land and sea breezes, or they blow in a line with the coast, inclining off the land at night, and from seaward early in the forenoon. In spring and summer, the sea breeze generally sets in about 9 a.m. and subsides suddenly at 5 p.m.; but outside the harbour, it continues later. In winter, the wind almost always varies between north and north-east in the day, and with some strength, generally lulling but not falling to a calm at night. During November, December, and January, sharp squalls off the land from the mountains, with rain, occur occasionally. During these months, and until March, the climate is equable and pleasant, never very hot in the day and always cool at night. *See also* Meteorological Table, page 555.

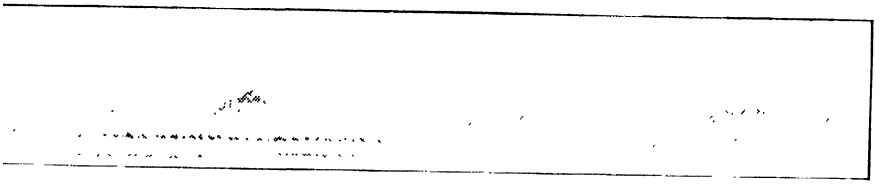
Sand-storms are experienced during summer; when fresh land squalls blow, sand fills the air for 40 or 50 miles seaward, rendering objects invisible at more than half a mile. During the winter months, when the high mountain ranges are generally hidden by clouds, the northerly wind sweeping along the plain between the mountains and the sea carries with it a cloud of reddish dust which dims when it does not entirely obscure the view of the lower and nearer summits.

The heat is very great during June, July, August, and September, the thermometer rising in sand-storms to 105° on board ship, and to several degrees higher in the town. Europeans have consequently to guard against sun-stroke and enteric fever, avoiding exposure to the sun as much as possible.

Chart 81, Mersa Darúr to Trinkitat.

ANCHORAGES southward of Suákin.—These anchorages are approached by the southern channel to Suákin, described on page 187.

Mersa Haddhu, 12 miles southward from Suákin, affords anchorage and landing for large boats and dhows. The entrance is about 2 miles S.W. by W. from South-west islet of the Kad Etwid group; it is only 50 yards wide and the depth is 2 fathoms just inside; the least water in the entrance is 7 feet. Mersa Likák Hindi, is 2 miles long with depths of from 3 to 6 feet; a lagoon harbour is approached by this entrance; it has



Tirowi *Gumbereid* (*W.* ½ *N.*)

View of the Entrance to Mersa Sheikh Ibrahim.

Chart 81, Mersa Darúr to Trinkitat. Var 2° 50′ W.

an opening at its northern end. There are said to be wells of indifferent water here.

Mersa Entabil and the northern entrance to Mersa Likák Hindi, both lying between Suákin and Mersa Haddhu, are but breaks in the reef useful only for small boats.

Plan on sheet 14, Mersa Sheikh Ibrahim.

Mersa Sheikh Ibrahim (*Lat. 18° 53′ N., Long. 37° 25′ E.*) is situated 16 miles southward of Suákin. From the entrance it gradually curves during the 8½ cables of its length to west-south-west and then opens out, southward, to an anchoring space 4½ cables long by 1½ cables wide, good holding-ground. The entrance channel is from one cable to half a cable in width; and the depths, from 17 fathoms at the mouth to 9 to 10 fathoms when half-way in, and 5 fathoms at its inner end between Cairn point on the north and the reef on its southern side. The anchorage within has from 4½ to 6 fathoms.

The highest part of mount Gumbereid, 1,310 feet, on with a notch in the distant hills, bearing W. ½ N., leads up to the entrance; enter on this bearing and keep in mid-channel, anchoring about one cable beyond Cairn point.

On the north-western shore of this harbour are some high mangrove bushes, near which traces of antelope, gazelle, &c., have been seen.

Plan on chart 81, Mersa Sheikh Sad.

Mersa Sheikh Sad, 19 miles southward of Suákin, is a well-protected reef harbour about 2 miles long, with from 3 to 4½ fathoms in the first mile, decreasing to 6 or 7 feet towards the head. There is room for a short vessel to lie at single anchor just inside the entrance, but farther in a stern anchor is required. The entrance is in a westerly direction, curving to north-north-west about 4 cables within the entrance, the principal length of the harbour lying parallel with the shore; its entrance is partly obstructed by shoals which can be seen under favourable circumstances.

The outer shoal in the entrance, with 6 feet water, is a mushroom-shaped coral head not easily seen, but which may be avoided by keeping close to the fringing reef on the northern side of entrance, which reef dries in patches. There is no good landing place in this harbour as the water shoals gradually and boats ground about 50 yards from the shore. The country in the neighbourhood appears to be uninhabited and is thickly covered with brushwood.

General charts 81, 8c, and 2523.

Plan on chart 81, Mersa Sheikh Sad. Var. 2° 50′ W.

Vessels approaching Mersa Sheikh Sad from the northward should keep the shore reef on board, avoiding projecting horns. The ground eastward is unsounded and many patches of discoloured water have been seen in that direction.

The INNER CHANNEL passing in-shore of Shab-ul-Shubuk commences just southward of Mersa Sheikh Sad; it is, however, very intricate and unsurveyed, and should not be used unless necessity requires it. *See* page 190.

Sandhills point is nearly 13 miles south-eastward from Mersa Sheikh Sad, and has sandhills on it about 60 feet in height; in the bight westward of the point is Barakat island. Reefs extend from the point 2 miles in a north-easterly and 4 or more miles in a north-westerly direction.

Plan 1948, Mersa Makdah.

Melita point, half a mile southward of which the land, covered with scrub, rises to a height of about 30 feet, lies 2½ miles eastward from Sandhills point, and forms the west extreme of Mersa Makdah; from hence there is a road to El Teb and Tokar.

MERSA MAKDAH is a capacious anchorage enclosed between the south-eastern part of Shab-ul-Shubuk and Ras Makdah. Anchorage in from 6 to 8 fathoms, sand and mud, may be found over the northern and north-western portion of the harbour under the lee of the reef, but the southern part should be avoided in consequence of the shoals extending northward from Ras Makdah.

Ras Makdah, the south-eastern point of the harbour, is a low point marked by a sandy ridge 37 feet high and a quarter of a mile long, the most conspicuous of the sandhills in the vicinity; three small islets, North, Centre, and South islets, only from 5 to 8 feet above water, lie northward of the point, eastward of which are Makdah patches, the easternmost of these being the Rambler and Fairway patches, described below.

Eagle anchorage.—At the south-western part of Mersa Makdah, there is also good anchorage in 5 fathoms, sand, 6 cables south-eastward of the beacon on the eastern end of Eagle island reef.

No supplies can be got in the harbour, but fish are plentiful and may be caught with the seine on the sandy shore just southward of Eagle island.

General charts 81, 8c, and 2523.

Plan 1948, Mersa Makdah. Var. 2° 50′ W.

Beacons are placed as follows in Mersa Makdah:—Shubuk beacon, on the south-eastern point of the reef at the eastern end of Shab-ul-Shubuk, as described at page 190; Sumar beacon, close to the western end of Sumar island; Point beacon, on the north-eastern edge of a detached reef, and one mile N.E. $\frac{3}{4}$ E. from Melita point; and Eagle beacon on the outer end of the reef extending eastward from Eagle island.

Rambler shoal, on the southern side of the entrance, extends $4\frac{1}{2}$ cables on a north-north-west line of direction and is 2 cables wide, with a least depth of 3 fathoms, coral, and $4\frac{1}{4}$ fathoms around; from it the Shubuk beacon bears N. by E. $\frac{3}{4}$ E. $1\frac{1}{8}$ miles.

Fairway patch.—Southward of Rambler shoal is a circular coral patch of 4 fathoms, 2 cables in diameter, lying with the Shubuk beacon bearing N. $\frac{7}{8}$ W. 2 miles from its centre.

Directions.—Mersa Makdah is approached by the southern Inner channel to Suakin (*see* page 192). Pass about a quarter of a mile southward of Shubak beacon, and thence to any required position, according to the weather.

Plan 675, Trinkitat harbour.

TRINKITAT HARBOUR (*Lat. 18° 40′ N., Long. 37° 44′ E.*).—About 2 miles south-eastward of Ras Makdah is Ras Mukden, the northern entrance point of the inlet forming the harbour of Trinkitat, about 10 miles inland from which is the fortified town of Tokar, with an Egyptian garrison, and commanding a richly productive district.

The entrance to Trinkitat is not easily distinguished as the coast is low and sandy.

A stone blockhouse for the convict guard on the shore at the south-western part of the anchorage is a useful mark.

The harbour is open to the north-east; its available width is about $3\frac{1}{2}$ cables; within the entrance it extends 8 cables to the southward, has a general depth of 4 fathoms, and is capable of accommodating twenty vessels of from 18 to 21 feet draught; the holding-ground is good. The shores of the harbour are sandy with low bushes; a sandy plain, flooded at times, extends some distance inland. In the south-eastern corner is the opening into a large shallow lagoon.

Shoals.—Katah Kennasha.—About half a mile off Ras Mukden is the extensive reef Katat Kennasha, which is steep-to, with a sandbank above water on its south-western part, and the remainder nearly awash; being always visible, it forms the

Plan 675, Trinkitat harbour. Var. 2° 50′ W.

best mark for recognizing the position of Trinkitat. Between this reef and the shoals off South point is a shoal, 2 cables long, within its 5-fathom limit, having 19 feet least water near its southern end.

A spit, on which there are from 5 to 18 feet, extends 3¼ cables northward from South point; the shoalest part sometimes breaks. A coral ledge also extends 1½ cables with 13 feet water near its extreme.

Directions.—Beacon.—The entrance between the shoals is little more than half a cable wide, with a depth of 24 feet in the fairway. Two temporary leading beacons were erected many years ago on the western shore of the harbour 120 yards apart; they consist of poles 35 feet high, the north-eastern one, close to the shore, being surmounted by a diamond-shaped cage; the south-western pole by a square cage. The beacons were still standing in 1902, though the south-western one was somewhat dilapidated. The beacons in line lead in between the shoals in 24 feet, least water, but should they be missing, a stranger should buoy the channel before attempting to enter.

There is good anchorage outside the harbour in about 6 fathoms, under shelter of Katat Kennasha.

Communication.—The railway to Tokar, starting from the south-western shore of the harbour near the stone block-house before mentioned, has been completed, also a small pier at its terminus. Trinkitat is also in telephonic connection with Tokar; and from thence by telegraph with Kassala, Khartúm, Massawa, Suákin, &c.

Chart 81, Mersa Darúr to Trinkitat.

Katat Teronbo.—About 4 miles south-eastward from Ras Makdam is the rocky shoal Katat Teronbo; it is steep-to on its seaward side but shoals gradually towards the shore, between which and it is a 3½-fathoms channel, where anchorage may be found in case of need.

Chart 8d, Red Sea, Sheet IV.

COAST.—This part of the coast is low, barren, and sandy, full of salt-water swamps, and in some parts covered with bushes, but no fresh water is known to be procurable. From the entrance to Trinkitat, the coast trends south-eastward about 26 miles to Ras Asis, between which and it is a slightly projecting point.

This coast and that farther south-eastward form the south side of the southern channel to Suakin, *see* pages 187–192.

General chart 2523.

Chart 8d, Red Sea, Sheet IV. Var. 2° 50′ W.

Gulf of Akik lies between Ras Asis and Ras Shakal, 13 miles apart; it has an average depth of about 10 fathoms, with Amarat islands in the south-east corner, and the Diamond and other shoals northward of them as described below.

Ras Asis (*Lat. 18° 26½′ N., Long. 38° 7½′ E.*) is a low sandy point, formerly marked by a cairn of loose stones, which, however, in 1904, had disappeared; from the point, a rocky shoal extends some little distance, and north-eastward of it is a 4-fathoms patch 1½ miles from the shore, with uneven soundings of from 5 to 15 fathoms for some distance outside it. Between Trinkitat and the slightly projecting point mentioned, are a few sandhills, but from this point to Ras Asis the shore is very low and sandy, and the country for several miles inland continues to be of the same description.

Barrat Dodam, 7½ miles from Ras Asis, at the head of the Gulf of Akik, is a narrow tongue of land with a reef, on which are some islets.

Plan on sheet 14, Akik Seghir.

Akik Seghir.—Anchorage (*Lat. 18° 15′ N., Long. 38° 12′ E.*).—At the head of Akik gulf, 5½ miles south-eastward of Barrat Dodam are three small coral islets lying in a north and south direction and extending 1½ miles from the shore at Akik Seghir. These islets with their reef afford protection to an anchorage eastward of the inner one in from 4¾ to 7 fathoms, half-a-mile from the small landing jetty.

To approach this jetty between the inner islet and the shore, boats have to cross a bar with as little as one fathom over it. Between the inner and the middle islet, and also between that and the outer islet, the depths are from 3½ to 4½ fathoms.

Half a mile inland from the beach are some wells dug in the sand, containing brackish water in the dry season. About one mile from the beach, in the direction of Quoin hill, are some remarkable ruins in a straight narrow line, 1½ miles in length, and from 20 to 60 feet wide; they are on raised ground, sloping from the centre to either side, and there are many graves.

Supplies.—The town of Akik appears to consist mainly of huts, and of barracks, at which about 100 Egyptian troops were formerly quartered. Supplies, including sheep and bullocks, may be obtained, and there is a caravan route to the interior.

General chart 2523.

Chart 8d, Red Sea, Sheet IV. Var 2° 40′ W.

Amarat islands.—From 2 to 3 miles westward of Ras Shakal, in the entrance of the Akik and standing on a coral reef, are the two Amarat islands, low and sandy, with a few bushes on them; a depth of 4 fathoms extends about a mile northward from the eastern end of the eastern island. Another small islet lies on the same reef southward of the eastern island; a little beyond it is a rocky patch. Between these and the land, on the south-eastern side of the bay, is a passage to Akik Seghir.

Diamond shoal.—A coral shoal, a mile long north and south, on the southern edge of which H.M.S. *Diamond* touched in the year 1878, lies about 2 miles northward of the eastern Amarat island. The least water found was 14 feet, with 12 fathoms close-to.

At from one to 1½ miles north-north-west from Diamond shoal, a crescent-shaped shoal was observed by H.M.S. *Melita* in 1896, with apparently about 2½ fathoms over it.

Plan on chart 8d, Khor Nowarat.

RAS SHAKAL.—Beacon.—Ras Shakal is the eastern point of the gulf of Akik. It may be recognised by a white stone beacon, surmounted by an iron cross, of which the top is 25 feet above the sea; erected on the outer rock on the point reef.

There are depths of from 6 to 7 fathoms at about 1½ miles from the beacon. A safe depth in which to pass Ras Shakal is not less than 30 fathoms, or 4 miles distant. Between Ras Shakal and the Karb islands, distant 12 miles to the north-eastward, the channel is clear with from 20 to 50 fathoms, but at 8 miles eastward from the Ras is a large patch with from 6 to 10 fathoms before-mentioned with the channel.

KHOR NOWARAT (*entrance, Lat. 18° 15′ N., Long. 38° 19′ E.*).—Its breadth from Ras Istahi, the north-western point to Ras Farajin, the south-eastern point, is 4 miles, and it is the same distance from Farajin island to the head; but, the island of Bahdur occupies a large space in the centre of the bay.

The coast surrounding the bay is low and sandy, but high land approaches within 5 miles of the shore.

Fronting the entrance is a chain of low sand and coral islands, which effectually keep out all swell or sea; they stand on coral reefs, and brushwood grows on some of them. The northernmost of these is Guban, a coral island 25 feet high and 5 cables off-shore, 1½ miles south-eastward of Ras Shakal; on the low eastern part of this island are two heaps of coral stones, now overgrown with grass, and therefore not easily seen.

General chart 2523.

Plan on chart 8d, Khor Nowarat. Var. 2° 40′ W.

South-eastward of Guban are the three Hajar islands, 20 feet high and all on one reef, covering a length of nearly 2 miles north-west and south-east.

Farajin island, 20 feet high, is connected with Ras Farajin by a reef, on which are two or three small islets, and through which native boats find a channel; there are also some small islets between Farajin and Bahdur island. The length of Farajin island, including Shatira island, joined to its north-western end by a reef, is nearly 3½ miles.

Entrance.—Depths.—There are three channels by which the entrance may be approached. The middle channel between Guban and Hajar island, which is apparently the best, has 5 fathoms on either side of a fairway shoal with 3 to 4 fathoms over it. The channel between Hajar and Farajin has a bar, with from 2 to 3 fathoms over it. There is a channel between Ras Shakal and Guban islands with 6 to 7 fathoms in the entrance, but no soundings are shown farther.

Off Ras Istahi, conical white beacon, west side of the entrance to the harbour, a 3-fathoms shoal extends 2½ cables, and off the western end of Shatira island is a shoal easily discernible; the channel here is about 4 cables wide, with from 4½ to 7 fathoms water. In the outer part of the bay, the depths are from 4 to 6 fathoms, mud; in the inner part, where vessels anchor south-westward of Bahdur, there are 4½ fathoms towards the island, gradually decreasing to 3 and 2 fathoms near the mainland.

Bahdur island, situated in the middle of Khor Mowarat, is 2½ miles long, and three quarters of a mile wide; it consists of coral rock with a low sandy plain on the western part; on the eastern part it is rather woody. The village of Akik Kebir on the south-western part of Bahdur is a small place almost deserted and of no importance, a few fishermen only remaining on the island. There is a square stone mosque, and a little westward of the village, on the margin of the island opposite the anchorage, is a small tomb.

Water.—About a quarter of a mile from the village are some tanks excavated in the solid rock, and a large cement tank also on the beach near the village intended to store water from an Egyptian condensing ship at one time placed here. In 1902, H.M.S. *Scout* found everything in a state of decay and the tanks half-filled with sand.

Tides.—It is high water, full and change, at Bahdur, at 1h. 15m.; the rise, 1½ feet.

General chart 2523.

Plan on chart 8d, Khor Nowarat. Var. 2° 40′ W.

Aspect.—As seen from Bahdur island, and which will not differ much when seen in the offing, Saddle peak, or Sugar-loaf is the southernmost detached hill of the near range southward of Bahdur, and resembles a sugar-loaf. Hummock peak is a remarkable rugged-topped hill, south-westward of the former. Bluff peak is north-westward of the last and in the same range, being about 10 miles inland, and the highest northern part of the mountains south-westward of Bahdur. Chimney hill or Jebel Babalin is a high and remarkable mountain on the most distant range in the same direction as the last. Quoin hill is a small peak in the northern part of the near high range westward of Bahdur. Mound hill, is a low, double-topped, isolated hill, westward of the Quoins.

Directions.—The entrance of khor Nowarat is difficult to distinguish at a distance, but if Mound hill can be distinguished and brought to bear S.W. by S., it leads towards Ras Shakal, marked by a beacon at 2½ miles eastward of the entrance, on nearer approach Guban island will be made out.

The best entrance is apparently that between Guban island and the Hajar chain, as before mentioned, with about 5 fathoms on either side of the middle shoal. In rounding Ras Istahi, give a berth to the spit extending 2½ cables off it, and then steer to the south-west to clear the shoal off Shatira island; in passing round the western point of Bahdur, give the spit off it a berth and anchor in 4 fathoms south-westward of the village. Deeper water and more room may be had northward of Bahdur.

Small sailing vessels proceeding from khor Nowarat to the southward find the channel between Hajar and Farajin very convenient during northerly winds, or coming into the khor from the southward with southerly winds, as it shortens the distance in and out, as well as saving the time occupied in working through the Middle channel.

Chart 8c, Red Sea, Sheet 3. Var. 2° 20′ W.

The SUÁKIN GROUP of islands, shoals, and reefs, as stated at page 184, front the coast from Suákin to Nowarat, some of the outer reefs lying more than 30 miles from the nearest shore of the mainland. Hind Kadám (*Lat. 19° 23′ N., Long. 37° 54′ E.*), with all the reefs and shoals bordering on the north-eastern approach to Suákin, are described at pages 184–187; the island of Tella-tella Seghir, with the reefs bordering on the southern approach to Suákin, at pages 187–190. It now, therefore, only remains to describe the islets and dangers not included in the two passages referred to, and mainly on the eastern or seaward side of this extensive group.

General chart 2523.

Chart 8c, Red Sea, Sheet III. Var. 2° 40′ W.

Barr Musa Kebir (*Lat. 19° 13′ N., Long. 38° 10′ E.*), somewhat circular in shape, with a diameter of about 8 cables, is an island composed of sand and coral, and has a few bushes on it; it lies on the seaward of the group at this part. Its northern point lies south-east 18 miles from Hind Kadám. There is a reef about a mile north-westward of the island, and no bottom at 100 fathoms close to its southern side.

Charts 81, Mersa Durúr to Trinkitat, and 8c, Red Sea, Sheet III.

Barakut island, about 9 miles westward from Barr Musa Kebir, is a low sand and coral island without anchorage, there being no bottom at 135 fathoms close to its southern side, but reefs extend from both eastern and western ends of this island.

Reefs.—Four large breaking reefs are found within a space extending nearly 5 miles northward of Barakut island; the second is Shab Barakut, and the northernmost, Shab Kutb. The latter bears W.N.W. 10½ miles from Barr Musa Kebir.

Chart 81, Mersa Darúr to Trinkitat.

Seil Ad-dar Kebir island (*Lat. 19° 13′ N., Long. 37° 48′ E.*), bearing W. by N. 11 miles from Barakut island, is a small sand and coral island, with a reef extending half a mile north-north-west from its northern point, but there is no bottom at 120 fathoms a short distance south-eastward of it.

Canara reef.—On this reef, discovered by the *Canara* in 1881, there are many shoal heads of one and 2 fathoms; it lies west-south-westward 5¼ miles from Seil Ad-dar Kebir.

Three small reefs, each about a cable in extent, lying in a line east and west, are thus situated:—the western reef lies 6 cables S. by E. from Canara reef, with the eastern reef distant 4½ cables from it.

Shab Muncar is a small crescent-shaped breaking reef, open on its southern side; in the summer of 1884, it had a sandbank near its western horn. It lies 6 miles southward of Seil Ad-dar Kebir. In 1886, a shoal patch, about 8 cables long east and west, was reported to lie 8 cables south-eastward of Shab Muncar.

Pender reef, about a mile long east and west, with 3¼ fathoms, lies N.N.W. $1\frac{6}{10}$ miles from the Muncar.

Franks reef.—This reef, discovered by the *Canara* in 1881, is assumed to be about one mile long east and west; the sea was observed to break on it. Its centre lies N. by E. about 3½ miles from Shab Muncar. This shoal was not seen by H.M.S. *Myrmidon* during her survey of this locality in 1884.

Starkey patch lies 4 miles eastward from Shab Muncar.

General chart 2523.

Chart 81, Mersa Darúr to Trinkitat. Var. 2° 50′ W.

Chiltern patches.—Chiltern patch, a small shoal with a depth of 2 fathoms, lies with Shab Muncar bearing N.N.W. ½ W. 4¼ miles. About 5 miles eastward of this patch is a bank about 3 miles in extent on which nothing less than 11 fathoms has been found. Another Chiltern patch of the same depth as that first described, discovered in 1890, lies 6 miles W. by N. ¼ N. from Barr Musa Seghir.

Chart 8c, Red Sea, Sheet III.

Barr Musa Seghir (*Lat. 19° 3′ N., Long. 38° 11′ E.*), 10 miles southward of Barr Musa Kebir, is an island about half a mile long, composed of coral and sand; it is steep-to, and close to its southern side is a depth of 238 fathoms.

Taimashiya island, 9 miles south-eastward from Barr Musa Seghir, is a low sand and coral island, where, in case of necessity, anchorage may be obtained. It is surrounded by a reef, and there are from 6 to 12 fathoms near its southern side, but the island is too small to afford any protection from swell.

Andi Seli island (*Lat. 18° 54′ N., Long. 38° 36′ E.*), 17½ miles eastward of Taimashiya, is a low circular coral island half a mile in diameter; about 2 miles north-westward from this island is a patch of rocks.

Lokhah island.—About 5 miles south-eastward from Andi Seli is Lokhah, also a low circular island about half a mile in diameter, with a depth of 67 fathoms at a short distance from its southern side.

Shab Lokhah is a breaking reef more than a mile in extent and lying 8½ miles S.W. by W. from Lokhah island.

Masámarhu islands.—E. by S. 5 miles from Lokhah is the island of Masámarhu (*Lat. 18° 50′ N., Long. 38° 45′ E.*); and south-south-east 2 miles from it is Karam Masámarhu. These islands are at the north-eastern corner of the Suákin group; both are low and consist of sand and coral, with bushes on them, and both are steep-to and surrounded by very deep water; they afford no anchorage whatever.

CAUTION.—In the navigation of this part of the Red sea, the mariner is again specially cautioned to be on his guard against the effect of cross currents; *see* page 23. The strength and direction of these currents varies extremely, and the knowledge of their existence should induce great vigilance and attention.

General chart 2523.

Chart 8c, Red Sea, Sheet III. Var. 2° 50′ W.

Tella-tella Kebir.—About 8 miles eastward from Tella-tella Seghir, described at page 188, is the southern end of the reef on which are the Tella-tella Kebir islands. These are three low sand and coral islands, having, at a distance, the appearance of being only one; they are covered with bushes, and the extent of the reef on which they stand is 3 miles north and south by about 2 miles wide.

Soundings.—From Tella-tella Seghir to these islands the soundings are regular, increasing from 7 to 28 fathoms, and then gradually decreasing to 20 fathoms, after which they are irregular towards the islands; the bottom, rocks and sand. There appears to be a barrier shoal of from 4 to 7 fathoms surrounding these islands at a distance of one mile, within which, at 5 cables from the islands, the depths are 10 or 11 fathoms. A spit, about 8 cables long, extends from the south extreme of the southern islet.

Charts 8c and 8d, Red Sea, Sheets III. and IV.

Falcon shoal.—A shoal marked "Position doubtful," over which H.M.S. *Falcon* passed, lies about 3½ miles southward of Tella-tella Kebir; from 6½ to 7 fathoms were obtained for a distance of half a mile. There are depths of from 25 to 30 fathoms around.

Ed dóm esh Sheikh island (*Lat. 18° 37′ N., Long. 38° 51′ E.*), the easternmost of the Suákin group, is low, thinly covered with bush, and surrounded by a reef, with 90 fathoms close to. At 3½ miles W. by S. of Ed dom esh Sheikh is Gharb Abi Isa islet. About 1½ miles east-south-east from the latter is a reef, awash, about 1½ miles in extent, north and south, with no soundings at 60 fathoms close-to on its eastern side.

Dahret ed-dák-hilat, another small islet, surrounded by a reef, with no bottom at 90 fathoms close to it, lies 4¾ miles south-westward from Ed dom esh Sheikh. At 1½ miles eastward of Dahret ed-dák-hilat is a coral reef, apparently steep-to, about 3 cables long north-east and south-west, less than a cable wide, and with 6 feet near its north-eastern extreme, where it occasionally breaks.

Gharb Miyun islet, 7 miles southward of Ed dom esh Sheikh, is surrounded by reef, and has foul ground extending 3½ miles eastward from it. At 2 miles westward from Gharb Miyun is Miyun islet also surrounded by reef with 160 fathoms close to its south-western side.

General chart 2523.

Chart 8d, Red Sea, Sheet IV. Var. 2° 40′ W.

Derráka (*Lat. 18° 28′ N., Long. 38° 44′ E.*).—About 4 miles west-south-west from Miyun is Derráka island, surrounded by a reef, and having more than 80 fathoms close northward of it. Nearly a mile off its north-western side is a shoal, about 2 cables long, on which the sea breaks heavily; the fringing reef of Derráka appears to extend some distance towards this reef.

Dhá-l-ghab island, encircled by a reef, lies 5 miles north-westward of Derráka and, 4¼ miles east-north-east from Dhá-l-ghab is Isa Abi, another small islet, surrounded by a reef.

Safinat shoal bears about 5 miles south-eastward from Derraka. It is a small one-fathom patch, with upwards of 40 fathoms close westward of it.

The island and dangers westward, with southern channel to Suakin, on page 187.

Anchorages.—As a rule the water is smooth inside the islands of the Suákin group, and anchorage may be had, in from 10 to 25 fathoms, in almost any part between Ras Shakal and Ras Makdah.

General chart 2523.

CHAPTER V.

WEST COAST OF RED SEA FROM KHOR NOWARAT TO THE STRAITS OF BAB-EL-MANDEB.

Lat. 18° 12′ N., Long. 39° E., to Lat. 12° 25′ N., Long. 43° 30′ E.

VARIATION IN 1909.—Decreasing 4′ annually.

Chart 8d, Red sea, sheet 4. Var. 2° 30′ W.

General remarks.—This tract of coast, on which the Italians acquired territory and formed settlements in the latter part of the last century, borders on the Abyssinian highlands, but is generally low and arid, gradually rising through the Dankali province, a space of about 40 miles to the first of the three series of plateaux of which Abyssinia is formed. These mountains, which are among the highest in the world, have, generally speaking, a peculiarly abrupt and precipitous appearance. No rivers worthy of mention empty themselves into the Red sea; the two most considerable on the eastern side of Abyssinia, the Hamazo and the Hawash, disappearing in the sands before reaching the coast, after having run a course of upwards of 240 miles.

Though Abyssinia is rich in productions, comparatively little intercourse is carried on with the outer world by way of the Red sea; Massawa, an Italian possession, affords the chief and almost the only outlet for its trade in this long line of coast. In the low coast region of Dankali, citrons, oranges, and sugar-cane are produced. Here also are to be found elephants and rhinoceroses.

The Inner channel on this side of the Red sea is continued in the North and South Massawa channels, lying westward of the Dahalak group of islands and shoals, and is fully described in the present chapter.

COAST.—Aspect.—From Khor Nowarat to Massawa, the coast is almost devoid of easily recognisable landmarks. Brassy Bight (*Lat. 18° 1′ N., Long. 38° 35′ E.*) is surrounded by trees and generally has some dhows anchored close to the edge of the shore reef. Therauba, 25 miles farther south-eastward, is more easily distinguished than any other part of this coast,

Chart 8d, Red sea, sheet 4. Var. 2° 30′ W.

as it is covered with high trees extending about a mile along the shore, and there are no other trees northward or southward of it for a distance of 20 miles each way.

From Nowarat, the coast trends south-eastward about 15 miles to Ras Abu Yabis, and is much broken up. Southward of Abu Yabis, near the shore, are some conspicuous mountains, named according to their peculiarities of form, as Round hill, &c. The coast fronting the hills is low.

Er-rih island (*Lat. 18° 11′ N., Long. 38° 28′ E.*) is 4 miles south-eastward of Farajin island, about 4½ miles long north and south, and of very irregular shape. It is low and sandy on the eastern part, but on the western side are some trees and vegetation and the ruins in coral rock of the ancient Ptolemais Theron. The highest part is a mound of ruins, which is visible from Ras Abid. Many tanks were seen there by the surveying party.

There is a bay on the western side of the island, with 3 and 4 fathoms, mud, the former depth being pretty close to the island. The entrance into this bay is along the northern side of Er-rih, passing between Farajin and the western extreme of that island; but there are only 2 and 2½ fathoms in the entrance, on a bar formed on a continuation of the coast reef. There is also a tortuous boat channel leading round the southern and south-western sides of Er-rih island from Ras Abu Tabis.

Ras Abid, 2 miles eastward of Er-rih, is a small sandy island and not a point as is implied, with its highest part to the eastward. It is separated from the mainland by a narrow channel affording protection for small craft, there being from one to 3 fathoms in it.

Seil Bahr is a rocky island one mile north-north-westward of Ras Abu Yabis, and north-westward of it is a rather large but low bushy island.

Ras Abu Yabis is a low bushy cape with small white sandhills.

Boundary.—Ras Kasar (*Lat. 18° 2½′ N., Long. 37° 36′ E.*), 5½ miles south-eastward from Abu Yabis, is a projecting point of some importance as being the northern boundary of the Italian protectorate, southward of it is Brassy village, mentioned on the preceding page. The coast reef about here in places nearly 2 miles off-shore, with breakers; and, within the outer part, between the patches, are depths of 3 or 4 fathoms, where dhows anchor. The shore is low and sandy, backed by high land.

General charts 8d and 2523.

Chart 8d, Red sea, sheet 4. Var. 2° 30′ W.

Rock.—In June 1904, the master of the steam-vessel *Trinidad* reported striking a rock about 5½ miles, eastward of Ras Abu Yabis, approximately, and north of Ras Kasar, and a sounding of 4½ fathoms was taken at the time. This rock was unsuccessfully searched for by H.M.S. *Sealark* in 1905, and again in 1906; nevertheless, it is shown on the chart in the position assigned, but marked as "Position doubtful."

COAST.—Mandalu is 18 miles south-eastward of Ras Kasar; there is at this place a very small bay between the points of the coast reef, where boats anchor. The shore hereabout is low and swampy but backed by high land, and a little within the beach is a salt plain, where the Bedouins come down with their camels to procure salt.

Therauba is a low projecting point 7 miles south-eastward from Mandalu; as previously remarked, it is distinguished from other parts of this coast by the high trees growing along the shore for about a mile, there being none elsewhere for at least 20 miles in each direction. From Therauba the coast trends south-south-east 12 miles and then more southerly part North Bluff for 34 miles to Karn Adaf, all low barren sand backed by high distant mountains.

North Bluff, about 600 feet in height, in Lat. 17° 20′ N. is a landmark for making the Massawa channel. Near the shore southward of it are Black Peak and Round hills described on page 216.

North Bluff Beacon.—A wooden framework triangular pyramidal beacon, surmounted by a cross, the top of which is 56 feet above the sea, described as erected close to the coast at the foot of Black peak, was not seen from H.M.S. *Harrier* when at anchor about 2 miles from the shore in 1902, but was reported to have been rebuilt by the Italian ship *Colonna* in 1909; possibly it had been destroyed and been rebuilt, but the mariner should be prepared for the occasional disappearance of artificial landmarks in these regions. This beacon is not a matter of any great importance.

Chart 164, Massawa channel.

Karn Adaf point, in the Massawa channel, projects but slightly from the coast line, and its position is perhaps best marked by a conspicuous group of trees about 5 miles southward of it, which may be seen a long way off when approaching from the northward though not so far when from the southward.

Soundings.—A bank, with from 8 to 40 fathoms, is charted as commencing about 6 miles north-eastward of Ras Abu Yabis, extending from thence about 46 miles in a direction

Chart 8d., Red Sea, Sheet 4. Var. 2° 30′ W.

parallel with the coast, at an average distance of 4 miles from it, with deep water inside; although gathered within a contour line, it is probably a series of isolated patches with very deep water around them.

Near the northern end of this bank is the supposed position of the Trinidad rock just now described. With such irregularities of depth, it might be expected that further examination of this vicinity would result in the discovery of many hitherto unknown dangers, and that such has been the case should induce the utmost vigilance on the part of those navigating these waters.

NORTH MASSAWA CHANNEL APPROACH.—The approach to the channel may be said to commence a few miles southward of North Bluff (*see* page 213), which bluff should be made for after rounding the Sawakin group. The following dangers lie in the eastern side of the entrance.

Dangers on east side of approach.—A rock has been reported to lie about 7 miles off-shore in, approximately, lat. 17° 7′ N., and depths of as little as 9 fathoms have been found near this spot. In 1889, the s.s. *King Arthur* reported striking on a shoal of about 2¼ fathoms in, approximately, lat. 17° 10′ N., long. 39° 10′ E., possibly the same shoal; it was unsuccessfully searched for by H.M.S. *Stork* in 1892 and again in 1897, the least water obtained being the depth of 9 fathoms already mentioned. The bottom was found to be very irregular, and it is probable therefore that a small rocky head does exist somewhere hereabouts.

Gannet bank (*Lat. 17° 0′ N., Long. 39° 12½′ E.*), discovered in 1886, and subsequently examined by H.M.S. *Stork* in 1897, lies 10 miles east-south-eastward from Karn Adaf point. The shoal within the 5-fathoms line, is about 6 cables in extent, north and south, 3 cables wide, and is of sand and coral. The bottom was plainly seen from H.M.S. *Gannet*; its position is not, however, always indicated by discoloured water, but with a current making over it, a swell and ripple are apparent.

From the shoalest part, 3¾ fathoms, the northern end of Karn Adaf saddle in line with Victoria peak bears W. ⅞ S.; and the Paps, three conspicuous hills, S.W. ½ S.

During the examination of this bank, the current was found to be setting over it, in a north-westerly direction at about three-quarters of a mile an hour.

Saunders reef (*Lat. 17° 11′ N., Long. 39° 23½′ E., approx.*), originally reported as seen breaking, in 1893, is of coral

Chart 164, Massawa channel. Var. 2° 30′ W.

formation, and about 2 cables in diameter; it has a least depth of 2 fathoms, with deep water close around, and is the northernmost danger in the approach.

Fawn reef.—Eastward of the shoals, and (exclusive of Saunders reef) the northernmost known shoal patches of the Dahalak bank, are the Fawn reef with 3 fathoms, in lat. 16° 58½′ N., long. 39° 34′ E., and another 3-fathoms patch 7½ miles north-eastward from the Fawn reef and nearly on the same bearing distant 33 miles from Difnein island. This latter shoal was not found when searched for by the *Fawn*, but it is known that there are many other patches of from 7 to 12 fathoms in different directions within a few miles of it, all surrounded by deep water. It is a neighbourhood to be carefully avoided by the mariner.

MASSAWA CHANNEL.

THE MASSAWA CHANNEL is the passage between the African shore of the Red sea and the coral archipelago of Dahalak, commencing in lat. 17° 11′ N. and ending in lat. 14° 40′ N. Reckoning from Difnein island to Ras Kosar it is 180 miles in length.

The North Massawa channel, from Difnein to the Narrows off Hartau peninsula, is on an average about 9 miles wide. At the Narrows, which may be termed the division of the two channels, it contracts to 2½ miles; the depths increase from 11 fathoms near the mainland shore to 35 fathoms and upwards near the islands.

The South Massawa channel, from the Narrows eastward and along the southern shore, has a breadth of about 13 miles.

The Massawa channels afford a convenient and safe passage, and, by the aid of the lights established by the Italian government, may be navigated at night with care, but much caution is requisite, as the islands are low, steep-to, and not easily seen.

Chart 8d, Red sea, sheet 4.

Mountains.—Aspect.—The character of the Abyssinian mountains is the same throughout the channel; flat table-lands prevail, with their axes north and south, but here and there sharp peaks break the line and are good marks when known. A broad sandy plain, rising gently from the sea, recedes 15 or 20 miles to the foot of these great ranges, where it attains a height of over 800 feet. This plain is dotted with small hills, generally conical in shape, and whose heights above the sea are

Chart 8d, Red sea, Sheet 4, Var. 2° 30′ W.

much dwarfed in appearance by the mountains behind, and by the almost imperceptible slope of the plain. This fact must be borne in mind when attempting to recognise the hills from the chart.

Round hills (*Lat. 17° 11′ N., Long. 38° 55′ E.*).—About 86 miles southward of Ed dom esh Sheikh island of the Suákin group, described at page 209, are the Round hills, two mountains lying near the coast, fairly close together, and bearing east-north-east and west-south-west from each other; on their northern sides they are precipitous but slope gradually on their southern sides, and, being much higher than the land in the vicinity, form good marks for a vessel approaching from the northward.

Southward of the Round hills the land is high close to the shore, with chains of hills and high mountains in the background.

Victoria peak, 30 miles inland and 48 miles west-north-westward from Difnein island, is a dome-shaped summit, 7,400 feet high, on the northern end of a flat range, and, when it can be seen, is the most easily recognisable mark about the entrance of the North Massawa channel. The peak keeps its shape from all points of view, and is higher than all the other mountains near.

Victoria Peak.
Victoria Peak, *S. 69° W. (mag.) distant 40 miles.*

Should the higher peaks be hidden, the Paps (*Lat. 16° 39′ N., Long. 38° 56′ E.*) may probably be made out. This is a double-peaked isolated hill, showing as three peaks in some directions, 1,150 feet high, and 11 miles inland on the plain, above which it rises 600 feet. There are other smaller hills round the Paps.

About 11 miles southward of the Paps is a group of volcanic cones; the highest is 1,120 feet in height. There are other smaller and less conspicuous hills on the plain further south.

Winds.—In the North Massawa channel northerly winds prevail, blowing stronger during the day than at night; inclining from the shore in the morning and veering north-eastward during the day. A low barometer (about 29·80 to 29·90) is invariably followed about two days later by a northerly wind which sometimes sets in suddenly and fresh,

Chart 164, Massawa channel. Var. 2° 30′ W.

at other times gradually, in either case it is preceded by light clouds. The barometer at once rises and remains high as long as the wind lasts.

When southerly winds blow throughout the channel, they generally continue during the night also, blowing strongly from the south-eastward by day, and at night veering to north-west and falling lighter. As long as the wind is from the south-west it is remarkably dry, but, on the wind shifting to the southward or south-eastward, the wet bulb thermometer instantly rises several degrees. This strong southerly wind seldom lasts more than four days. The barometer gives no warning, but falls as soon as the wind sets in.

In the South Massawa channel, southerly winds are the most prevalent, bringing up a considerable swell, which is met as a vessel bound southward nears Shumma island, even when the wind does not blow home. The remarks as to the shifting of the wind in the North channel apply equally here.

Frequently there is a fresh south-easterly wind southward of Shumma whilst the wind off Difnein and Harat islands is northerly.

Off Massawa, the direction of the sea breeze is generally about east.

Rain comes with northerly winds and falls during the prevalence of these winds from the end of November to the beginning of March. The rainfall varies much. *See also* Meteorological table, page 556.

Currents.—The direction of the currents in the Massawa channels is very variable. In January and February, the south-easterly winds blowing in the middle of the Red sea are strongest, creating a southerly surface current along this shore, much influenced, however, by the local winds in the channel and by the tidal movement.

Tidal streams.—In the North channel, the flood stream sets southward, the ebb northward, and these movements are often very regular; at other times, the south-going stream does not cease but is only checked by the ebb and accelerated by the flood.

In the South channel, the tidal streams are difficult to distinguish. In January and February, southerly currents have been observed to prevail against southerly winds, but in March and April the current is usually to the northward. It seems, however, to be much governed by local winds, and, off Ras Kosar, in the latter month, after five days' continuous south-easterly wind, has attained a rate of 1½ knots to the north-west.

The tidal streams appear to meet at the Narrows off Shumma island.

General charts 8d and 2523.

Chart 164, Massawa channel. Var. 2° 30′ W.

Tides.—It is high water, full and change, at Difnein about 12h., at Massawa at 1h., and at Ras Maurekh at 12h. 30m.

The rise and fall of the tide varies much with the wind, but springs average about 4 feet, and neaps 3 feet.

Directions.—North Massawa channel.—Vessels from the northward, bound through the Massawa channel, should shape a course to pass 15 miles eastward of Ed dom Sheikh island (*Lat. 18° 37′ N., Long. 38° 50′ E.*), small, low, thinly covered with bushes, and one of the easternmost of the Suákin group, from whence the course hitherto recommended has been to steer for North Bluff hill (*Lat. 17° 20′ N.*); then to stand along the land to the southward at from 2 to 4 miles from the shore which leads well inside the Gannet shoal and foul ground north of it; the mariner is, however, cautioned that the space between the Suákin group and Difnein island has not been closely examined, and that the shoal just referred to, as well as others, have been discovered in recent years, within and near this space.

The appearance of the land and most prominent marks are described at page 213; the general prevalence of a thick haze in winter, however, renders the approach from the north-eastward to the entrance of the North Massawa channel by the aid of shore marks often difficult, and sometimes impossible; but, as a rule, when the haze is thickest the sky is clear, observations can be obtained, and the effect of any cross or counter current may be thus counteracted; when clouds prevail (usually with a northerly wind) the land is tolerably clear, though the highest peaks may be capped.

By keeping along shore from the North Bluff, the channel is easy and the track is about 3 or 4 miles off the coast all the way to Massawa harbour.

At night, Difnein, Sheik ul Abu, and Madote island lights are good guides to Massawa and to the Narrows.

For South channel directions, *see* page 250.

Anchorage.—On the mainland side, anchorage ground is abundant throughout the whole length of the channel, though in most places there is little or no protection from south-easterly winds; but the holding ground is generally good, and the space, except in the South Massawa channel, is too confined for much sea to get up. For these reasons, it is advisable to keep nearest to the mainland shore, and as each anchorage is described in detail hereafter, it is not necessary to give any further directions for the passage, beyond a general caution that the reefs off the mainland do not always show, and that the reefs on the island side are steep-to.

General charts 8d and 2553.

Chart 164, Massawa channel. Var. 2° 30′ W.

Order of description.—Following the order of description adopted in this work, the coast forming the western side of North Massawa channel as far as Massawa will first be described, and then the islands and dangers on the eastern side. That northward of Karn Adaf within the entrance has been described with the approaches, page 213.

Afterwards the southern Massawa channel will be described in the same order.

WESTERN SHORE.—Kandellai is a small mangrove islet near the mainland, 19 miles southward of Karn Adaf and 9 miles westward of Difnein, and the shore reef. The island is not easily made out unless the vessel is close in. In this neighbourhood the coast is fringed with mangroves, and shallow water extends some distance, the 5-fathoms line being one mile from the shore in places.

Mersa Mubárak and Mersa Ibrahim.—About 5½ miles southward of Kandellai is Mersa Mubárak, with a small woody island, slightly detached from the mangrove swamp behind, at its entrance; and 2 miles farther in the same direction is Mersa Ibrahim. These are two small boat anchorages within the fringing reef.

From Mersa Ibrahim to Ras Harb, 45 miles distant to the southward, the coast forms a slight curve, the shore being sandy and bordered by jungle.

Meláhát, 27 miles southward of Mersa Ibrahim, and its neighbourhood, is backed by salt-water swamps, where the natives procure salt, beyond which are ranges of low barren sandhills.

Shoals.—At 15 miles northward of Ras Kuba (*Lat. 16° 21′ N.*) the shore reef projects nearly 2 miles, ending in a point where there is a 2-fathoms head. At 2 miles north-eastward from the 2-fathoms head is a 5-fathoms patch; also, at one mile south-eastward from the 2-fathoms head, and 2 miles off-shore, is a small 4¾-fathoms patch.

At about 5 miles northward of Ras Turrik, and from thence southward fronting the bay into which the Uachiro river flows, are some patches of 3 and 4 fathoms, 2½ miles from the land. About 5 miles south-eastward of these, and 3 miles eastward of Ras Turrik, are two more patches of 4 and 3½ fathoms; from these Ras Harb bears S. by E. ¾ E. 5 miles.

Oreste shoal.—This shoal, discovered by the Austrian Lloyd's steam-vessel *Oreste*, lies about 2 miles eastward of Ras Harb; it is of small extent, consists of sand and coral, has 3¾ fathoms water, and from 12 to 14 fathoms between it and the

Chart 164, Massawa channel. Var. 2° 30′ W.

shore; from it, Dohul Bahut islet bears N.N.E. ¼ E., and Anafi minaret, Massawa, S. ½ W.

Ras Harb (*Lat. 15° 48′ N., Long. 39° 25′ E.*), is a low rounded sandy point 11 miles northward of Massawa harbour entrance. There is no reef off it, but the 5-fathoms line is from 7 cables to a mile from the shore.

Eberemi tomb, about 5 miles southward of Ras Harb and close to the shore, has a dome roof, and is a very conspicuous and useful mark to vessels from the northward. In clear weather it can be seen at a long distance, and even in hazy weather it can generally be distinguished through the haze.

Jebel Karamburra, or Round hill.—About 18 miles westward from Ras Harb is the north-western end of a range of hills, 1,630 feet in height, extending about 8 miles south-eastward on the plain from this position. Although when the higher mountains are visible, these appear insignificant, they often show well when the former are obscured, and Round hill, the summit at the north-western end, being nearly detached and of a bold rounded form, it makes a good landmark.

NORTH MASSAWA CHANNEL.—Eastern side.—The islands and dangers forming the eastern side of the North Massawa channel to abreast Massawa harbour will now be described.

Chart 164, Massawa channel.

Dahalak bank.—The islands on this bank lie between the parallels 16° 37′ N. and 15° 22′ N., Difnein being the most northern and Bu-l-hissar the most southern of the group; the shoals extend far beyond these limits. The islands are principally composed of coral with fringing reefs; the channels between are of moderate depth, with many shoal patches. For vessels intending to reach the western shore in this vicinity there is no channel across the Dahalak bank southward of Enta-entor island (*Lat. 16° 21′ N., Long. 40° 14′ E.*), that is, for a space of nearly 50 miles in a south-easterly direction.

Caution.—The bottom on the Dahalak bank is principally sand and coral, with an occasional patch of mud. From the nature of the bottom there is a great probability of the existence of many shoal patches not marked on the chart; therefore, great caution is required when navigating in this vicinity, for, although the coral shoals, if large in extent, may sometimes be seen, those of sand cannot be distinguished from

Chart 164, Massawa channel. Var. 2° 30′ W.

the light-coloured water everywhere prevalent on this bank. In most parts of the Red sea, on the contrary, the reefs are steep-to and can easily be distinguished by the difference in the colour of the water, the reefs nearly always showing white.

The northern dangers of 3 fathoms, are referred to at page 214, approaches to Massawa channel; for others north-eastward of Difnein, *see* the chart.

Two-fathoms bank, 9 miles eastward of Difnein island, is an extensive coral bank, with from 2 to 3 fathoms water, which can generally be seen.

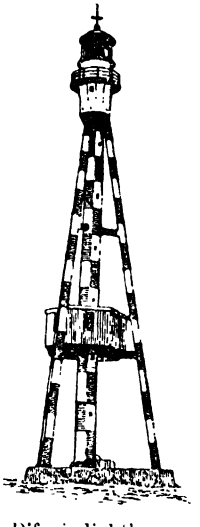
Three-fathoms bank.—At 18 miles east-north-east from Difnein is another large coral bank, with 3 fathoms on it.

Difnein (*Lat. 16° 37′ N., Long. 39° 18½′ E.*), the north-western island of the Dahalak group, is situated about 35 miles within the northern entrance of the North Massawa channel; it is of coral and sand, a mile in extent, 30 feet high, covered with mangroves, with deep water and but little reef around it. The island is intersected by salt-water creeks. It shows an undulating outline from the northward with a lighthouse on its north-eastern point. There is no convenient anchorage off Difnein.

Kandellai island lies abreast on the opposite side of the channel to Difnein, and about 9 miles distant. For islands eastward on Dakhalak bank, *see* page 250.

LIGHT.—From a structure, 126 feet high, consisting of iron columns, the central column chequered black and white, the outer column painted in black and white horizontal bands, on the north-eastern point of Difnein island, and at 144 feet above high water, is exhibited a *white flashing* light visible 18 miles; the *flash* shows every *five seconds*.

Vessels passing eastward of Difnein should pass it within a distance of 5 miles to avoid Two-fathom bank farther eastward; the fairway is westward of the light.



Difnein lighthouse.

Current.—In February 1887, whilst stopped off Difnein island, in the channel, H.M.S. *Cygnet* found the current setting W. ½ S. one mile an hour. About the same time, when at anchor on the 2-fathoms bank just mentioned, the current set W. ½ S. eight-tenths of a mile an hour.

Entesila, 6 miles southward of Difnein, is a small coral island, uniform in outline, and covered with dense bush, 20 feet

Chart 164, Massawa channel. Var. 2° 30′ W.

above the water line. There is a reef from one to 2 cables in width around it; and, to the north-westward, a shelving bank on which a vessel might obtain indifferent anchorage, in 12 fathoms, coral about 6 cables from the island.

At 4½ miles southward of Entesila is a sand and coral bank with 4 fathoms on it.

Abu Rabah (*Lat. 16° 27′ N., Long. 39° 29′ E.*), is a small wedge-shaped coral island 35 feet high, with small rocks off its north-eastern and south-western ends; it lies well eastward of the fairway, 13½ miles south-eastward from Difnein, and 9 miles westward from Awali Shaura. There are depths of 14 fathoms just northward of Abu Rabah, and more than 80 fathoms at a mile to the eastward.

Kad-hu, its western end, 15 miles south-eastward of Entesila, is a narrow island 2 miles long east and west and rather high, with a rocky islet 1¼ miles off its western end.

A bank extending about 3 miles northward from Kad-hu, has 8 fathoms on its northern end, and 26 fathoms close to it.

Kad-hu island is about 5½ miles northward of the northern end of a sandy and rocky bank, which, trending in a south-easterly direction, with other banks to the southward, forms the eastern side of the deep channel passing down the eastern side of Hárat. This bank is about 3 miles wide, and the most dangerous part is towards the south-eastern end, which is lost in the nest of shoals lying between Jerom island and Hárat, where there are many spots with as little as 2 fathoms.

Hárat—Beacon (*northern end, Lat. 16° 9½′ N., Long. 39° 25′ E.*) is an island 7½ miles long, north and south, on the eastern side of the North Massawa channel, its northern point being 22 miles southward of Entesila. The main portion is 30 feet high, has on it a few stunted bushes, and presents an uniformly flat outline, at the northern point where is a slight rise to 35 feet, on which stands a beacon surmounted by a ball, and also an iron structure. Its southern end takes a decided turn westward; from its extreme, a reef, on which is the islet Sheikh ul Abu, presently described, extends 2 miles farther westward into the Massawa channel; there is anchorage both northward and southward of this reef. A few huts and wells are to be found on the western side of the island, affording a scanty supply of brackish water in the dry season.

Shab Hárat, a narrow reef generally visible, extends from the northern end of Hárat island nearly 9 miles in a north by west direction, and for 5 miles still farther northward are small banks with 5 and 6 fathoms water on them. Dangerous coral patches are found all over Hárat reef; its western edge is steep-to.

General charts 8d and 2523.

Chart 164, Massawa channel. Var. 2° 30′ W.

Another detached bank of 7 fathoms lies 2 miles westward of the northern end of the reefs. This being principally sand and surrounded by deep water shows distinctly.

Seil Badira, 15 feet high, is a small coral islet on Hárat island reef, 1¾ miles north from the northern point of that island. There are three smaller islets on the same reef nearer the Hárat shore.

Sheikh ul Abu is the low sandy islet on the reef projecting into the channel from the southern end of Hárat. The reef extends only 1½ cables south-westward of Sheikh ul Abu, but reefs project 1¼ miles from it in a north-westerly direction.

LIGHT.—From a shed and wooden framework erection on the western point of Sheikh ul Abu islet, at 46 feet above the sea, is exhibited a *fixed white* light, visible 10 miles, except where the light is obscured through an arc of 90° to the north-eastward, viz., from S. 10° W. through west to N. 80° W.

Sheikh ul Abu lighthouse.

Anchorages.—There is anchorage in 12 fathoms, with protection from southerly and easterly winds on the west side of Hárat 2½ miles northward of Sheikh ul Abu, with Seil Badira touching the left extreme of Hárat bearing N. ¼ E. Also southward of Sheik ul Abu, in 13 fathoms, sand and mud, with the right extreme of Hárat N.E. ½ E., and the left extreme of Sheikh ul Abu N.N.W. There is a 4-fathoms patch 1¼ miles south-eastward from Sheikh ul Abu light.

The bank on which is the last-named anchorage, extends 10 miles south-south-eastward from Sheikh ul Abu with depths varying from 11 to 20 fathoms, sand and mud.

Eastward of this bank, and of Hárat, is the deep channel before alluded to, which separates them from the adjoining islands.

Dohul Bahut (*Lat. 15° 57′ N., Long. 39° 31′ E.*), is 7½ miles south-eastward of Sheikh ul Abu, and 10 miles north-eastward of Ras Harb on the opposite side of the channel. It is a small sand and coral island surmounted by a con-

Chart 164, Massawa channel. Var. 2° 30′ W.

spicuous clump of trees, 35 feet high. A reef extends 5 cables northward from it, but on the southern side it is very narrow. There is anchorage all round in from 7 to 17 fathoms, the shoaler water being at 1½ miles from its north-eastern side.

Dahret.—At 3½ miles south-eastward of Dohul Bahut, and on the same bank of soundings, is Dahret, a small low sandy islet.

Dohul.—East 2 miles from Dahret is the western point of Dohul, a large low flat island, 3 miles long east and west, 2 miles wide, and about 20 feet high. It is connected with Dahret by a 3-fathoms ridge. There is a village, with a square white mosque, on the northern shore, and half a mile eastward of it is a grove of dom palms, visible 10 miles. On its southern shore, outside the coast reef, which extends from 3 to 5 cables, it is steep-to.

Baradu.—At 4 miles eastward of Dohul Bahut, and 3 miles north-eastward of Dahret, is Baradu, a sandy island, 20 feet high, 1½ miles long, and with palms near its centre. A reef borders the western side of Baradu, extending 1½ miles in that direction; it is joined to Dohul by an extensive reef on which are from 3 fathoms to 3 feet; reefs also extend a long way to the northward as charted.

Dhu Rakaham (*Lat. 15° 47′ N., Long. 39° 44′ E.*) is a small coral and sand island 25 feet high, wooded in the northern part, and lies 9 miles south-eastward of Dohul, and 18½ miles north-eastward of the entrance to Massawa harbour. It is fringed by a reef, which falls suddenly into deep water; so that there is no anchorage except on the northern and eastern sides, where a narrow ledge of coral extends 2 or 3 cables from the reef. The extremes of the island bearing N.W. and N.N.E. mark the best berth on the south-eastern side.

Dar Ghulla, 25 feet high and wooded, is a similar island 2 miles eastward of Dhu Rakaham. There is 7-fathoms patch off the southern end of this island, but the bottom is very foul. A reef with only 2 fathoms lies east-south-east 1½ miles from Dar Ghulla.

The islands and dangers south eastward will be found with Dahalak island and South Massawa channel.

Plan 460, Massawa harbour.

MASSAWA HARBOUR APPROACH.—KHOR DAKHILIYA is a small bay with good anchorage, on the northern side of the island, which forms the northern border of Massawa harbour. The inner half of the Khor is shallow, but the outer part which affords anchorage ground is about 5 cables in extent, with depths of from 5 to 7 fathoms, mud.

General charts 164, 8d, and 2523.

Plan 460, Massawa harbour. Var. 2° 30′ W.

A reef extends 2½ cables from Ras Dogon, the northern point of entrance, most of which dries, and from the southern point a reef extends 3 cables to the northward, thus narrowing the navigable entrance to 2½ cables, but giving protection to the anchorage during south-easterly winds.

Beacon.—Near the centre of the southern reef is Dakhiliya rock, marked by a small beacon.

Two small shoals, with depths of 1¾ fathoms, mud, lie just within the 5-fathoms line towards the head of the Khor.

Plan 460, chart 164.

MASSAWA HARBOUR (*Obs. spot, Lat. 15° 37′ 12″ N., Long. 39° 27′ 23″ E.*) is a narrow deep water inlet between Massawa and Taoualoud islands on the south, and Jezirat Jerrar and another island on the north. On the eastern face of the northernmost island and about 4 cables from its southern extreme, is the white tomb of the Sheikh Abd-el-Kadir, after whom the point, 1½ cables farther south, is named. The islands are joined to each other and to the mainland by reefs on which are causeways connecting them with each other and with the mainland.

The outer or main harbour, about 6 cables long from the entrance in a general west-south-west direction, and about 2 cables wide, affords good holding-ground in 8 fathoms, sand and mud, but has not much room. At the head of the main harbour is a narrow navigable 5-fathoms channel into the Western arm which is a continuation for about 7½ cables of the main harbour; this arm has from 3 to 5 fathoms water over a considerable space varying from half a cable to 1½ cables in width; there are, however, several shoals in the middle towards the head of the arm, and the shore reefs extend a long way out. The causeway connecting Taoualoud island with the mainland crosses the reef at the head of this Western arm; with strong south-easterly winds, a swell sets in and the causeways are sometimes flooded.

Just within the entrance to the harbour, the North-west arm branches off from the main harbour with from 7 to 4 fathoms water, but is less than a cable wide in the entrance.

Entrance.—Depths.—There are from 13 to 15 fathoms water immediately outside the entrance, from 9 to 12 fathoms in mid-channel in the entrance, and from 9 to 6 fathoms in the available anchorage space in the main harbour.

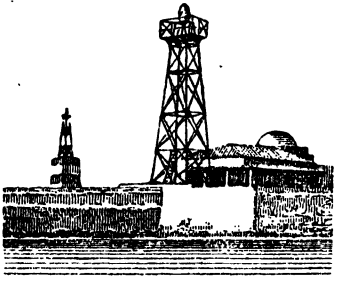
Reefs, marked at their extremes by light-buoys, as presently described, border the entrance points on both sides, the southern reef being the most extensive and most difficult to see, there being from 2 to 3 fathoms on it, 1½ cables northward of Ras Mudir beacon. On the northern side the reef surrounding Ras Abd-el-Kadir projects about a cable and is rather steeper.

General charts 164, 8d, and 2523.

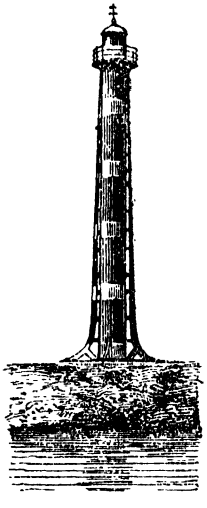
Plan 460, Massawa harbour. Var. 2° 30′ W.

LIGHTS.—About the middle of the eastern face of Massawa island on the southern side of the entrance stands Ras Mudir lighthouse, an iron cylindrical tower 77 feet high, painted in black and white bands. From it is exhibited, at 85 feet above high water, a *fixed white* light, visible 15 miles.

Leading lights.—On Seraglio island at the head of the main harbour are shown two *fixed red* lights, 126 yards apart, which, in line, bearing S. 67° W., lead into Massawa harbour midway between the light-buoys at the entrance. The front light is shown from an iron framework on the quay, painted in black and white bands, at 32 feet above high water, and is visible 6 miles distant; the rear light is shown at 64 feet above high water, from a similar iron framework, similarly painted and standing on a square stone tower, the remains of an old building, and is visible 9 miles.



Leading lights.



Massawa. Ras Mudir lighthouse.

Light-buoys.—A light-buoy of cylindrical form, painted black, and showing a *fixed red* light, is moored off the reef projecting northward from Ras Mudir, 2¾ cables N.N.E. from the fort flag-staff, and marks the southern side of the entrance to Massawa harbour.

A light-buoy, chequered black and white, and showing a *fixed green* light, visible 5 miles, is placed southward of the reef extending from Ras Abd-el-Kadir, and defines the northern limit of the entrance channel. These buoys are about 130 yards apart. The buoys are not to be entirely relied on, as they may be washed away.

Beacon.—A spar beacon surmounted by a cage, the whole chequered black and white stands on the northern extreme of Ras Mudir.

General charts 164, 8d, and 2523.

Plan 460, Massawa harbour. Var. 2° 30′ W.

Directions.—Bring the leading mark light structures in line by day, or the lights by night, bearing S. 67° W., and pass midway between the light-buoys at the entrance, and from thence steer up the centre of the harbour to the anchorage. In summer, when the sea breezes are generally light, sudden squalls come off the hills, and, if intending to remain many days, it is best to moor; but in winter violent land winds seldom blow.

Prohibited anchorage.—Telegraph cable.—In order to avoid damage to the submarine telegraph cable communicating with Asab and Perim, which leaves the shore in an east-north-easterly direction, just northward of Ras Mudir lighthouse, vessels are prohibited from anchoring outside the harbour in that locality, southward of a line drawn East from Ras Mudir light-buoy. Two small beacons indicate the line of the telegraph cable.

TOWN.—Massawa was ceded to Italy by Egypt in 1885; the town stands on Massawa island, the outer small coral island forming the southern side of the harbour, and was formerly a most wretched and dirty place, partly built of coral and partly of mud, and only occupying the inner part of the island. Since its occupation by the Italians it has greatly improved, many new houses having been built. The causeway connecting the town with Taoualoud island is about 450 yards long.

Quays.—Railway.—Commencing from the causeway, a stone quay has been constructed along the North front of the town, on which bollards are placed at short intervals, so that vessels anchoring on or near the leading line may haul their sterns in towards the quay. Farther eastward a wooden pier, with water pipe, was carried out to the edge of the reef, but it is now in a state of decay.

The causeway connecting Taoualoud island with the mainland is 7 cables long, fortified at the island end, and has hut barracks for the troops.

A line of railway for military purposes extends inland as far as Sahati, a distance of about 17 miles; it passes through Hotumlu, Makullu, and Dongali, and all the stations on the line are strongly fortified. The Massawa terminus is on the northern side of the harbour, on the peninsula of Abd-el-Kadir, now nearly covered with the storehouses of the naval arsenal. On the south-western shore of this peninsula are several piers and boat slips.

Coaling and watering Piers.—Jezirat Jerrar, the inner of the two islands forming the northern side of the port, is occupied by military storehouses and barracks, and its western end is fortified. Two wooden piers have been carried out from this island to the edge of the reef in the North-west

Plan 460, Massawa harbour. Var. 2° 30′ W.

arm; and three stone jetties with steps, a wooden water-pipe pier, and a coal jetty have been constructed on the southern side of the island towards the main and middle harbours; the depth at the head of these piers is not accurately known.

A mooring buoy for the use of the Italian guardship lies midway between the heads of the two outer stone jetties.

A steam crane, with a lifting capacity of about 3 tons, stands at the head of each of the two outer stone jetties on Jezirat Jerrar; also one, with a capacity of about 25 tons, near the naval stores.

From Seraglio island, a wooden watering pier projects to the edges of the deep water on its north-western side, and on its north-eastern side is a short but substantial stone pier.

The most conspicuous buildings at Massawa are the palace of the Commandant, a domed house with pillars, on Seraglio island at the head of the harbour, and the mosques, one of whose minarets can be seen 10 miles distant, the other being concealed by new buildings; the custom-house is a tall white house close to the mosques. A considerable garrison is maintained at Massawa and in the neighbouring villages, but no estimate of the present civil population is obtainable.

Signals.—From a flag-staff on the custom-house quay, approaching vessels are signalled. The white ensign is hoisted to indicate the approach of a British vessel of war.

Coal and supplies.—Coal to the amount of from 3,000 to 4,000 tons is generally in store at Massawa; it is supplied by lighters and is put on board rapidly. Provisions, meat, and other supplies are plentiful and cheap.

Water is brought into a large reservoir on Taoualoud island by pipes from the village of Makullu, 4 miles distant, where it is pumped up from a well giving a constant supply, but the water is not of good quality. It is led on to the watering pier before mentioned. There is also a large reservoir, with taps all round, in the western part of the town. Government condensers produce the best supply, and a government steam tank can pump on board about 60 tons an hour. Contractors also supply condensed water of good quality at 10*s*. per ton.

Trade and communication.—The exports are ivory, gum, hides in considerable quantities, and a little gold, brought by caravans from the interior; the imports are, wheat and piece goods, British and Indian. There is weekly communication with Naples, and also with Aden, connecting there with the Indian mail; all by the Florio-Rubattino line. A small English steam-vessel also trades between Aden and Massawa.

Climate.—The climate of Massawa is intensely hot, but, on the whole, not unhealthy. Land and sea breezes appear to prevail all the year round, the latter from the north-eastward,

Chart 164, Massawa channel. Var. 2° 30′ W.

and double the strength of the former. The temperature is very much the same as that of Suákin, and certainly not cooler. About 4 inches appears to be the total ordinary rainfall for December, January, and February. *See also* Meteorological table, page 556.

Tides.—It is high water, full and change, at Massawa at 1h.; springs rise 4 feet, neaps 3 feet.

Jezírat Sheikh Said, or Turtle island, is a small sand and mangrove island one mile southward of Massawa, surrounded by a wide reef and connected with Massawa island by a shoal bar, over which 2 fathoms is the best water in mid-channel. Between it and Taoualoud is an inlet in the reef one mile long with from 10 fathoms in the entrance to 3½ fathoms close up to the causeway connecting Taoualoud with Massawa.

Plan 460, Massawa, and chart 164, Massawa channel.

HARKIKO BAY.—Southward of the Massawa islands the coast-line sweeps round in a bold bay, called Harkiko Bay, 6 miles wide to the land near Ras Guddam south-eastward of it. Southward of Jezirat Sheik Said and the reefs charted south-west of it, Harkiko bay is all deep to within 5 cables of the shore, except off the village of Harkiko, where at 6 cables from the shore, is a small coral shoal with a least depth of 19 feet, with the minaret of Harkiko bearing N.W. by W. ½ W. 9 cables. There is a passage one cable wide, with 6 and 7 fathoms water, between it and the shore. There are many shoal patches of one and 2 fathoms in the south-western bight of Harkiko bay.

The coast-line is low, and the plain rises gently to the foot of the low coast ranges 2½ miles inland from Harkiko.

Harkiko is a large village standing on the shore about the middle of the bay, to which it gives its name. A minaret and several houses show up white from a distance. A jetty starting from near the large white house at Harkiko extends 410 yards seaward.

Jebel Guddam, south-eastward of Harkiko bay and within the western side of Annesley bay, is an isolated mountain mass, rising 3,035 feet above the sea, and wooded to the summit. It is a magnificent landmark, and, in clear weather, may be seen from a position northward of Harat island. In shape, it is irregular and rounded, with several little peaks of nearly the same altitude, none being markedly superior to others. The true summit is a small pyramidal peak, about 12 miles south-south-east from Massawa, conspicuous from the north by its shape, and situated about a third of the breadth of the top of the mountain from its eastern side.

Jebel Guddam and the plains around it abound with game. Ostriches, wild boar, guinea fowl, spur fowl, antelope, gazelle,

Chart 164, Massawa channel. Var. 2° 30′ W.

and hares are all to be found at about a mile from the sea-shore. The plain is dotted with small villages, and affords pasture for many cattle and sheep.

Ras Guddam.—Shoal.—Ras Guddam is a low rounded coral point, separating Harkiko and Annesley bays. A shoal marked by discoloured water, and with a least depth of 2¾ fathoms, lies 1¼ miles E. by N. ¼ N. from a conspicuous tree on the shore about three quarters of a mile south-eastward of Ras Guddam, and only just within the 20-fathoms line.

ANNESLEY BAY.—Ghubbet Zula (*Entrance, Lat. 15° 33′ N., Long. 39° 40′ E.*).—Annesley bay is a deep bight included between the high land of Hartau on the east and the land of Guddam on the west. It is a fine inlet extending 26 miles to the southward; its greatest breadth is 12 miles, and its least, abreast of Malkatto, 4 miles. From the shores of this bay, in the days of the Ptolemies, the Greeks carried on the thriving trade with Axum, by way of Degonta; while, in more recent times, the Portuguese and other modern travellers have taken the route by Massawa. The ancient Greek city Adulis, the emporium of their trade, was then close to the western shore and is charted near Malkatto; its ruins are now 4 miles inland on the left bank of the Hadas, the modern village of Zula is said to be on the right bank of that river.

Aspect.—When seen from the Massawa channel, Quoin hill, 249 feet high, on the eastern shore of Annesley bay, in line with Disei island, shows as a sloping piece of land of the quoin or wedge shape, the bluff being to the north-west. Jebel Dulhe, 764 feet high, and the highest land of Hartau, is very conspicuous. On the western side of the bay, as already described, is Jebel Guddam and other high land sloping gently towards the sea.

Depths.—There are depths of 44 fathoms, mud, in the western or main entrance of Annesley bay, decreasing gradually to 25 and 18 fathoms, mud, in the southern part; and, from 16 to 12 fathoms are found pretty close to the shore, except on the western side, about 8 miles southward of Ras Guddam, and also between 14 and 17 miles southward of the Ras, the shore bank extends off a mile, with as little as 6 feet at its edge off Arafale at the head of the bay, where a shoal of 2¾ fathoms projects 7 cables from the beach. The eastern shore is foul to nearly a mile off between Melita Bay and Dolphin cove.

Directions.—No special directions are necessary for entering Annesley bay, which is easy of access. Pass 2 to 3 miles off Ras Guddam, the western point of the entrance, within which there are no dangers beyond a half to a mile

Chart 164, Massawa channel. Var. 2° 30′ W.

off shore. There is a light on Madote island on the eastern side, for which, and for the shoals north of it, *see* page 235.

Malkatto (*Lat. 15° 15′ N., Long. 39° 42′ E.*), the place of debarkation for troops during the Abyssinian expedition of 1868, is a few yards southward of the place where the dry bed of the river Hadas above mentioned reaches the sea, and the ships were moored 2½ cables off-shore. The land is low and shelving near the beach in the vicinity of the river bed, and at high water a considerable portion covers with the tide. The site of the encampment is called Malkatto, from a well of that name about a mile inland. Malkatto is now an Italian post marked by a flag-staff.

When the sky is clear, there is a magnificent view of the Abyssinian Alps from the anchorage, the passes cleaving them literally from north to south, so that the ridges appear to rise one above the other in a succession of waves; the plain around Malkatto also looks green, but on landing, all illusion as to its nature caused by its green appearance is at once dissipated. A sandy plain, overlying clay, intersected by dry beds of torrents, and overgrown with such plants as salicornia, acacia, calotropis, and tufts of coarse grass in patches, extends from the sea-shore to the mountains.

The Shohos, who inhabit the plain, are a black race with rather woolly hair, small boned, but with regular, and in some instances even handsome features. They cultivate a little jowari, and have cattle of a very small breed, besides asses, goats, and sheep; their huts are scattered over the plain.

Game.—Round Malkatto, and in the vicinity of Dolphin cove at the head of the bay, game abounds, and especially so during the rainy season, which commences in December; antelopes, gazelles, hares, bustards, and spur fowl are plentiful. On the eastern side of the bay wild pigs, which feed on the sea-shore, may be found.

The rain-fall is very small.

Arafale.—At the head of Annesley bay, on the south-western side, is the village of Arafale, consisting of a collection of mud huts at the mouth of a valley, close to the shore. Here is an Italian fortified post, with a garrison of about 150 men. There are three conspicuous extinct craters a mile or two southward and south-eastward of it.

The anchorage off Arafale is quite open; a coral reef extends about 1½ cables from the shore, and at a distance of 7 cables is a shoal of 2¾ fathoms before mentioned.

Water may be procured at Arafale by digging, and there are several wells. At Alifat, about 5 miles to the north-westward, are hot salt springs.

General charts 164, 8d, and 2523.

Plan of Dolphin cove on sheet 1109. Var. 2° 30′ W.

Dolphin cove (*Lat. 15° 8′ N., Long. 39° 49′ E.*).—On the south-eastern side of the head of Annesley bay, is Dolphin cove formed in the fringing reef; it is about 2½ cables wide and the same depth, with from 7 to 4 fathoms water, sand and mud, good holding-ground.

The shore of the cove is flat and low, but at about 700 yards inland rises suddenly to a rocky ridge, 492 feet in height, fronting Jebel Abdur, 804 feet high and about 1¼ miles inland. South-eastward of the cove are ridges of old black lava fields, thickly covered with brushwood. Northward of the cove, the country is more sandy and open.

Game abounds here and plenty of fish may be caught with the seine at the head of the cove.

Beacon.—A stone beacon, coloured white, plainly visible from seaward, stands on a mound, 38 feet above the sea, at 3⅚ cables E. ¼ N. from North-west rock, the northward point of the cove.

Leading beacons have also been established. They (1901) are three in number and are whitewashed. The rear beacon, very small, is on the summit of the 492 feet ridge mentioned; the front beacon is on a lower ridge of sandhills, about 2⅓ cables inland, and the intermediate beacon is nearest the rear beacon, about 80 yards down the seaward face of that ridge. The three beacons in line bearing N. 88° E., lead through the centre of the entrance to an anchorage in 7 fathoms.

Water.—Supplies.—Currency.—Several wells of good water are to be found in the wadies about three quarters of a mile from the beach in an east-south-east direction from the cove. Fresh meat may be purchased from the natives through the local sheikh; payment has to be made in Italian money, (Erithrœan coinage), which may be obtained at Massawa and is the only coin current in Annesley bay.

Plan on sheet 1109, Melita bay.

Melita bay, 6½ miles northward of Dolphin cove and one mile eastward of Ras Nasircurra, affords anchorage with shelter from all winds but those from the south-western quarter. The bay proper, bordered by a grassy plain about 20 feet above the sea, is about 2 miles long north and south, and 1¼ miles wide, but a broad fringing coral reef with from one to 2 fathoms water only, fills up the greater part of the bay; whilst the spit extending from and around Cliff point is awash at low water at its outer edge, the inner parts remaining covered.

General charts 8d and 2523.

Chart 164, Melita bay. Var. 2° 30′ W.

A $3\frac{3}{4}$-fathoms patch lies about 9 cables south-eastward from Cliff point and in the approach to this anchorage.

Anchorage may be found in from $6\frac{1}{2}$ to 8 fathoms, sand and stones, with a beacon, 10 feet high, standing on the shore in the north-eastern part of the bay, bearing N.N.E. $\frac{1}{2}$ E., distant $1\frac{4}{10}$ miles. There is softer bottom, in a depth of 6 fathoms, about 3 cables W. by S. of this position.

Supplies.—Fresh meat can be obtained here on similar terms to the supply at Dolphin cove.

Chart 164, Massawa channel.

COAST. — From Ras Nasiracurra north-westward, for about one mile, at about 3 cables off shore, are patches of 2 and $3\frac{3}{4}$ fathoms. The village of Nasiracurra lies in a bight just northward of the Ras; midway between the Ras and Quoin hill is the village of Macalille, with a flag-staff.

South-west Hartau point. — Beacon. — This point, forming the north-western extreme of the Hartau peninsula, is $5\frac{3}{4}$ miles northward of Quoin hill; it is 138 feet in height, and is marked by a white masonry beacon.

DISEI ISLAND, in the entrance of Annesley bay, is one of the pleasantest spots in the Red sea. It is volcanic, 4 miles in length north and south, with a succession of conical peaks, of which Mount Disei, the highest, above Village bay and $2\frac{1}{2}$ miles from the northern end, is 341 feet high. The southern end of the island is scarcely more than 2 miles from Ras Hartau, but its eastern side widens out to about 3 miles from the northern end of the Hartau peninsula; a reef projects eastward upwards of 5 cables, from the inner side of its southern point. Its picturesque shape, the verdure of its valleys, and the vegetation on its hills, are a relief to the eye, especially as seen from the anchorage of Village bay.

Plan on chart 8d, Village bay.

Village bay. — Anchorage (*Lat. 15° 28′ N., Long. 39° 44′ E.*).—This small bay on the eastern side of the island is just northward of Mount Disei. It affords good anchorage in 7 fathoms, with the northern point of the bay N.W. by W. $\frac{1}{2}$ W. $1\frac{2}{3}$ cables, and Mount Disei peak S.W. $\frac{1}{2}$ S. A shoal, with a rock awash at half tide, lies on the southern side of the anchorage 2 cables from the shore eastward of the Disei peak.

Care is required in entering this anchorage, as the water shoals very suddenly. There are depths of 17 fathoms only at half a mile from the shore.

General charts 8d and 2523.

Plan on chart 8d, Village bay. Var. 2° 30′ W.

The village is small and there is plenty of live stock, but the inhabitants do not seem anxious to sell. The Italian flag is shown from a flag-staff in the village, and may assist in making the anchorage.

Water.—There are some wells of good water near Village bay, but they are not convenient for watering a vessel.

Chart 164, Massawa channel.

Disei channel, between Hartau peninsula and Disei, is deep and wide. The volcanic islet Sheel, 80 feet high, on which there stands a white masonry beacon, lies in mid-channel eastward of the peak; it may be passed on either side. Off the southern end of Disei are West rocks, and east-south-east 5 cables from them, are East rocks; both are white, 15 feet high, and, being surrounded by reefs, the channel between them is narrowed to 3 cables, with a depth of 10 fathoms. East rocks lie one mile south-eastward from the southern point of Disei; between West rocks and the southern end of Disei is a 1¾-fathoms patch.

Indore rocks, about half a cable in extent, are distant 3 cables E. ½ S. from East rock, and are coral heads with 6 feet water over them; it is reported that they cannot be seen even from the masthead and with a favourable light; the Hartau side of the channel, here steep and bold, must therefore be hugged by a passing vessel to avoid the three dangerous rocks. The shore between Ras Hartau and Quion Hill is skirted by a reef, projecting upwards of one mile from the shore off Alibarat, and must be given a berth.

Hotha island is 3¼ miles eastward of the Disei reefs and 5½ miles south-south-east from Madote, it is 1½ miles long north and south, and about 50 feet high, with a flat top. At low water it is connected with Hartau peninsula, 2 miles distant to the southward, by a dry reef.

A reef extends 1¼ miles north-eastward of Hotha, and the bay between it and Ras Korali to the eastward, is mostly shoal, with patches of rock.

MADOTE ISLET.—LIGHT (*Lat. 15° 35′ N., Long. 39° 41′ E.*).—Madote islet, off the northern end of the Hartau peninsula, is the first landmark on the south side of the South Massawa channel, after passing Massawa harbour. It is a low sand island 8 feet high, 16 miles from Massawa. On it stands a lighthouse consisting of a square wooden building surmounted by an iron frame-work structure, from which is exhibited, at 47 feet above high water, a *fixed white* light, visible 10 miles.

General charts 8d and 2523.

Chart 164, Massawa channel. Var. 2° 30′ W.

Madote islet is near the northern end of the long reef, extending 5 miles northward from Disei island, which reef projects 5 cables northward beyond Madote.

Anchorage.—There is anchorage on the north-western side of the islet in from 10 to 15 fathoms, sand, with the centre of Madote on with Jebel Dulhe S.S.E. $\frac{7}{8}$ E., but the anchorage must be approached with caution, as the ledge is very narrow and falls quickly into deep water.

Mujunía reef, 3 miles north-westward of Madote lighthouse, is about one mile in extent, with a small one-fathom patch on it. There is anchorage in about 9 fathoms at one mile north-eastward of the shoal part, which can generally be seen.

Abdulla-Aba-Madda bank, of coral, with a least depth of 7 fathoms, lies in the north-western fairway to the Narrows, 4 miles north-north-eastward from Madote islet; the bank is of oval form, and is one mile in length, following the direction of the channel.

Tides.—It is high water, full and change, at Disei at 1h.; the rise at neaps is 3 feet A branch of tidal stream flows perceptibly southward into Annesley bay.

SOUTH MASSAWA CHANNEL.—The northern entrance to this channel, situated about 25 miles eastward of Massawa harbour, is about 9 miles wide between Hartau peninsula and the south-west part of Dahalak island. The navigable breadth is much reduced by the Assarka islands and Shumona island, but the channels are deep. For details *see* pages 236 and 237.

HARTAU PENINSULA, a low tongue of land, 24 miles long and from 13 to 16 miles wide, projects from the mainland in a north-north-westerly direction, its western side forming the eastern boundary of Annesley bay, and the other side, the southern shore of the South Massawa channel. The northern extreme of the peninsula is Ras Korali; westward of that Ras the land is deeply intersected by shallow bights and bordered by several islands, of which Hotha, just described, is one.

Jebel Dulhe is a range of hills extending north-west and south-east on the Hartau peninsula, the culminating point being a cone, 764 feet in height, at the south-eastern end of the range, which cone preserves its shape in all directions, and is a good landmark; it must not be mistaken for Disei island peak, which has a very similar appearance when seen from the northward, though only half the height.

General charts 8d and 2423.

Chart 164, Massawa channel. Var. 2° 30′ W.

From Dilemmi island southward to Howtha point, the shore of the Hartau peninsula trends south-eastward 15 miles, and is all low, but with little reef bordering it. A 4-fathoms patch lies 1¼ miles, and a 3-fathoms patch 2 miles south-eastward of Dilemmi.

Dilemmi island.—Beacon.—This island, jutting out north-eastward from the mainland of Hartau peninsula, with which it is connected by drying reefs at low water, forms the southern boundary of the Narrows and has but very little reef extending from its eastern side, so that it may be passed within 2½ cables. A stone beacon, about 20 feet high, stands on the north-eastern part of the island, and is not visible from the anchorage on the north-western side.

The island is 25 feet above the sea and is partially wooded; its centre is a spacious grass plain which affords pasture for numerous cattle and sheep. On the western side of the plain are many wells, mostly dry in December. Game abounds both on the island and on the mainland in the vicinity of Ras Korali, where antelope also are found in addition to hares, spur fowl, guinea fowl, and bustard. Fish may, at certain seasons, be caught by the seine.

Anchorage.—During southerly winds, there is a fair anchorage north-westward of Dilemmi in 13 fathoms, mud, a mile from the shore, or closer to it in 6½ fathoms; it is, however, not a snug anchorage, for the strong south-easterly breezes send in a troublesome swell in the outer anchorage; and, at the inner one, the reefs are too near to be pleasent; the landing is at times difficult.

The small-pox hospital, formerly established here has long been disused, and the building is a ruin.

Assarka islands (*Lat. 15° 32′ N., Long. 39° 55′ E.*), 9 miles eastward of Madote island light, are two small islands, about 20 feet high, on the south-western side of the Narrows leading into the South Massawa channel. They lie north-west and south-east from each other with a 10-fathoms channel, 3 cables wide, between them. They are 1½ miles from Dilemmi island. The northern Assarka island is mostly edged with low cliffs, and has a small masonry beacon on its western extreme, originally whitewashed, but reported to have become so weather-worn as not to be distinguishable a mile distant.

The southern island is all sand; a reef awash extends 4 cables south-eastward from it.

About 2 miles south-eastward from the southern Assarka is a 5-fathoms patch, and less than a mile southward of that island is a 4½-fathoms patch. Anchorage off the Assarkas cannot be recommended.

General charts 8d and 2523.

Chart 164, Massawa channel. Var. 2° 30′ W.

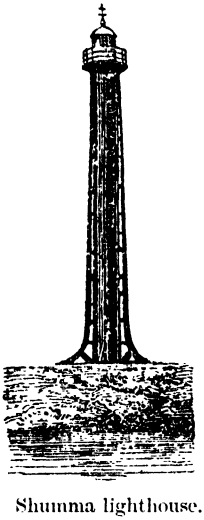
THE NARROWS, about 8 miles wide, are further contracted by the islands of Shumma and the Assarkas. There is deep water throughout and the shore and islands reefs are steep and easily seen. The land on either side is low but well defined, being coral walls, 5 or 6 feet in height.

Between Dilemmi island, of the Hartau peninsula, and Assarka islands is a channel 1½ miles wide with 14 fathoms and upwards with patches of 3 to 4 fathoms on its eastern end as charted. There is no object in using this passage.

The main channel of the Narrows between Shumma and Assarka is 2½ miles wide with from 30 to 40 fathoms water, but with a 5-fathoms patch abreast of Shumma at 2 miles S.E. by E. from the southern Assarka.

North-eastward of Shumma is a passage of the same width, with an average depth of over 60 fathoms.

Shumma island (*Lat. 15° 32′ N., Long. 39° 50′ E.*).—This wooded island, about 50 feet in height and 2½ miles long by one mile wide, lies nearly in the centre of the Narrows. It is surrounded by a fringing reef extending about half a cable round its extremes, from 2 to 3 cables on its north-eastern side, and with varying width, but to as much as 5 cables on the south-western side; the reef is everywhere steep-to, falling into deep water. No anchorage can be obtained anywhere round the island except in Port Smyth, as presently described.



Shumma lighthouse.

LIGHT.—From a black cylindrical iron lighthouse, 77 feet high, on the southern end of Shumma island, at 108 feet above the sea, is exhibited a *fixed* light, visible 16 miles, showing *white* from S 38° E. through west and north to N. 68° W., and *red* on all other bearings; that is to say, it shows *white* in passing through the channel southward of Shumma, *red* in passing through the northern channel. The keeper's dwelling is close to the lighthouse.

BEACON.—A small beacon has been erected near the north-western extreme of Shumma island.

Plan on chart 164, Port Smyth.

Port Smyth (*Lat. 15° 32′ N., Long. 39° 58′ E.*).—This little harbour is in the centre of the south-western side of Shumma, where a break in the edge of the reef affords an

Plan on chart 164, Port Smyth. Var. 2° 30′ W.

entrance to a snug harbour about 6 cables long by 2½ cables wide, with general depths of from 3 to 4¼ fathoms, and a small pool with 5½ fathoms, sand and weed, good holding-ground. The entrance, between a point of reef on the right and a patch nearly awash on the left, is half-a-cable wide and has from 3¾ to 4 fathoms on a coral bar, a cable outside the narrowest part.

Leading beacons.—Two leading beacons, in line when bearing N. 58° E., stand opposite the entrance to the port; the front beacon, on the shore, is a pyramid of masonry surmounted by an iron skeleton ball, the whole painted white. The rear beacon is of similar construction but surmounted by a pole painted black.

Directions.—Bring the beacons in line and keeping them so, run in through mid-channel of the narrow entrance; then, hugging the patch on the port hand, starboard the helm as soon as that patch is abeam to avoid another patch nearly awash a cable within the entrance on the starboard hand, and then anchor as convenient. It is well to have a boat ahead in entering this little port.

The southern shore of the channel, to Ras Shaks, distant about 90 miles will first be described.

Umm Namus.—Anchorage (*Lat. 15° 24′ N., Long. 40° 2′ E.*).—This small island, 30 feet high, and having on it some conspicuous trees, lies 1¾ miles from the shore, and 10 miles south-eastward from Dilemmi.

Its reef extends about 5 cables, but is narrow on the shore side. There is a one-fathom patch 2 miles north-westward from Umm Namus, which must be avoided when approaching the anchorage from, or leaving it for the northward.

Sheltered anchorage may be taken up inside the island, in 14 fathoms, according to the direction of the wind. It is best to anchor near the island both for protection, and to avoid some 3¾-fathoms patches of coral off the mainland shore.

Fawn shoal.—In March 1881, H.M. surveying vessel *Fawn* found less water than was previously supposed to exist 4 miles north-eastward from Howtha point. The *Fawn* anchored on the shoal, which has a least depth of 5 fathoms. Again, in 1889, from the s.s. *King Arthur* discoloured water was observed, *approximately and by dead reckoning*, about 2 miles eastward of the Fawn shoal; but it is most probably the same shoals but vessels should keep a good look-out when in this vicinity.

HOWAKIL BAY, about 31 miles long, from Howtha point to Ras Andadda, receding 14 miles from that line, and

Chart 164, Massawa channel. Var. 2° 30° W.

commencing 5 miles southward of Umm Namus. It is a maze of islands and reefs, with channels between only imperfectly surveyed; but, under the lee of the outer islands, are several good anchorages presently described.

There are numerous mountains and hills at the back of Howakil bay, some in ranges, others are isolated volcanic cones and table-hills. The only one used as a landmark is Barn hill, a small but remarkable table-hill, 480 feet high, on the shore of the bay, 10½ miles southwest from Howakil peak. In very clear weather, the magnificent heights of Abyssinia may be seen rising range after range to a height of 10,000 feet.

Howakil island is nearly in the centre of the bay, its sharp volcanic summit rising to a height of 720 feet (*Lat. 15° 8′ N., Long. 40° 11′ E.*). It is of an irregular shape, 6 miles long, north-east and south-west, and 3 miles wide, the seaward portion being low and of coral. Off its north-eastern point is the small island Laksu, 20 feet high, connected with it by a reef which can be crossed in a boat only. There are a few mat huts and some scanty wells of water in a bay facing south-east. The inhabitants are wretchedly poor.

Adjuz appears to the eye a perfectly level coral island, 30 feet high and sprinkled with bushes. It is about 2½ miles in diameter and lies 1½ miles northward of Howakil, with a navigable channel, much encumbered by shoals, as presently described, between them. There is but little reef off Adjuz, and what there is can always be seen. There are a few miserable huts on its southern shore, and some wells.

Tahara islet is situated on a sand bank always dry and in mid-channel southward of the south-western point of Adjuz. There is a 4½-fathoms channel between it and Adjuz, but the bank extends eastward in mid-channel between Adjuz and Howakil, and on it are the following dangerous shoals.

Shoals.—In the entrance to the channel between Howakil and Adjuz, commences a shoal extending 5 cables in a west-south-west direction by 2¼ cables wide, with as little as 5 feet water. Between this shoal and Adjuz there is a clear channel, 4¼ cables wide.

In line between the shoal just described and Tahara islet is another shoal of 2½ fathoms about 2 cables in extent. Close to the southern shore of Adjuz, is a shoal about a cable in extent with only 8 feet water.

Three miles E.N.E. of Adjuz is a 10-fathoms patch, with 18 to 20 fathoms close to.

General charts 8d and 2523.

Chart 164, Massawa channel. Var. 2° 30′ W.

Anchorage.—There is excellent anchorage on all sides of Adjuz in from 9 to 5 fathoms, sand and mud.

In a south-easterly breeze, smoother water will be found westward of the island with the south-western point, a sandy spit, bearing E.S.E., and the western point N. by E. A depth of 5 fathoms, sand, will be found here, and there is no danger in the channel from the northward if a vessel does not get westward of the line of the western point of Adjuz on with Howakil peak until the Dahleid bank, a one-fathom patch 1¼ miles westward of Adjuz, which generally shows, is seen on the starboard bow.

In a northerly wind, the channel between Adjuz and Howakil affords the best anchorage, avoiding the shoals just described lying along its centre. Anywhere on the Adjuz side are good berths in from 4 to 6 fathoms. The Howakil side has also several patches, and, in entering from the eastward, no part of Laksu island must be brought eastward of E. ½ S. until assured of being northward of the 5-feet reef in the entrance.

Temporary anchorage can also be obtained westward of the next unnamed island, 4 miles north-westward of Adjuz, at 7 or 8 cables from the shore in 10 fathoms, sand, with Howakil peak seen over the centre of the island bearing S.E. by S. Between this island and the point southward of Umm Namus, in fine weather, the anchor can be dropped anywhere on the same bearing in from 10 to 14 fathoms.

Between Howakil and the islands of Delgummun south-eastward of it, is a crescent-shaped bay, 3 miles wide, but nearly filled with reef, and affording no protection in strong winds. The best anchorage is at the entrance of the bay, in 7 or 8 fathoms, sand and shells, near the north-eastern point of Howakil, with its peak bearing S.W. by W. ¼ W., and with the whole of Lasku islet well open of the north-eastern extreme of Howakil.

Jebel Baka (*Lat. 15° 0′ N., Long. 40° 16′ E.*) is the largest island in Howakil bay, but standing farther back and being a flat-topped table land, 520 feet high, it is not so conspicuous as the peaked and higher Howakil. Its northern point is 3½ miles southward of Delgummun. From this northern point, a reef, on which is an island 20 feet high and 1½ miles long, extends nearly 5 miles in a north-easterly direction; this reef forms the southern side of a channel leading into the inner part of Howakil bay, passing southward of Howakil and Delgummun. To enter this channel, bring Barn hill, 480 feet high, to bear S.W. by W. ½ W. and steer for it on that bearing.

Anchorage.—There is good anchorage everywhere in the channel just described, and well protected as soon as the island

Charts 164, Massawa channel. Var. 2° 30′ W.

on the reef north-eastward of Jebel Baka is passed. A good berth is in 6 fathoms, sand and mud, about north-north-west from the western point of that island.

Umm-es-Sahrig is a coral island which can scarcely be said to be in Howakil bay as the whole of it is outside a line connecting its two points; it is 20 feet high, and 1¼ miles in diameter, and lies 14 miles south-eastward from Hawakil peak, and 3½ miles northward of Ras Andadda; its north-eastern side may be considered as the southern boundary of the entrance to the South Massawa channel. The island is dotted with low bushes, and there is scarcely any reef on its outer shore, but on the inner side it is connected with the mainland by reefs, in many parts dry at low water, and with no more than 2 fathoms over them in any part.

A small 4-fathoms patch lies one mile eastward of Umm-es-Sahrig, with from 8 to 10 fathoms water between the patch and the island.

Anchorage.—Good anchorage in southerly winds may be found north-westward of Umm-es-Sahrig, in 8 fathoms, 1½ miles distant from it. Also, in northerly winds, on its southern side, 7 or 8 cables distant from the shore, but its eastern point should not be brought to bear eastward of N. by E.

Ras Andadda (*Lat. 15° 1½′ N., Long. 40° 30′ E.*), the south-eastern point of Howakil bay, is a small promontory with two double-peaked hills on it 240 feet high. A line drawn from this to the northern side of Jebel Baka island has nothing but reefs and shallow water between it and the shore.

Landmarks.—Beach hill is another promontory, 2¾ miles south-eastward of Ras Andadda; it is a double-peaked hill similar in shape to those on Ras Andadda, but rather higher, being 330 feet above the sea. It is a good landmark, and can be plainly distinguished from a vessel's deck at a distance of 18 miles, looking like an island, the land from which it rises being very low. There is no reef off these two promontories.

Other volcanic hills rise from the plain behind Beach hill, but they are not so conspicuous.

From Beach hill, the coast trends in a general south-easterly direction for 16½ miles to the entrance of Hanfela bay. There are two coral points on this line of coast, Ras Gurmud and Ras Maurekh, with bays between them entirely filled with reef.

Ras Gúrmud, the northernmost of these, is 4½ miles south-eastward of Beach hill. It is a coral point, 15 feet in height, and makes as an island even when close in-shore, it being only connected with the main land by a low neck of sand.

General charts 8d and 2523.

Chart 143, Jebel Teir to Perim. Var. 2° 30′ W.

Ras Maurekh, about 8 miles south-eastward from Beach hill, is a similar point but presents a longer face to the sea. It is charted as an island on the coral reef fringing the coast, and is backed by a mangrove swamp. There is a depth of 5 fathoms fairly close to Ras Maurekh, but off it, about 2 miles from the shore, are three patches with 4 and 5 fathoms on them.

Jebel Maurekh consists of three remarkable black cones, 2¼ miles inland, and 5 miles southward of Ras Maurekh. Two rise about 420 feet above the sea; the third is lower. They are isolated and are seen at a great distance on a clear day. *See* view on chart 143. The northern cone is truncated.

Plan 733, Hanfela bay.

Ras Madr, the northern point of Hanfela bay, is of coral, and is, at high water, the north-eastern point of an island, but at low water is connected with the mainland by dry sand. The island is about 2 miles long, presents cliffs of coral about 20 feet high, and is about 30 feet high at its widest part.

Boat harbour.—There is a narrow boat channel through the reef which fills the bay between Madr island and Ras Maurekh, leading to the northern point of the former, and there is a good boat harbour inside. The southern large cone of Jebel Maurekh on with the northern point of Madr island leads to the mouth of this channel.

Anchorage.—The anchor can be dropped anywhere along this coast, in fine weather, in from 8 to 14 fathoms, from 1½ to 3 miles off-shore.

Plan 733, Hanfela bay.

HANFELA BAY is a large bay contained between Ras Madr, and Ras Hanfela, 10 miles south-eastward of it. Within the bay are many islands and shoals. The land at the back is a vast plain dotted with small hills, and bordered on the south, 10 miles distant, by mountains extending westward. The villages of Arassan, Madr or Madir, and Hanfela, stand on the shores of this bay.

Barm-al-Haji are the two outer islands of Hanfela bay. The outer one, Benat-l-wa (*Lat. 11° 50′ N., Long. 40° 50′ E.*), is 4¼ miles east-south-east from the outer point of Ras Madr, and is a small flat bare coral islet 10 feet in height; the other, Benat-l-wa, is 1¼ miles south-westward of the first and has bush on it. The islands are connected by a bank which should not be approached too closely, but which, in case of necessity, has a 3¼-fathoms channel over it, about midway between the islets.

General charts 8d and 2523.

Plan 733, Hanfela bay. Var. 2° 30′ W.

Anchorage.—In southerly winds, good anchorage may be found westward or north-westward of the outer island, in 7 to 8 fathoms, sand and mud.

Daramsas or Hanfela island (*Lat. 14° 45′ 11″ N., Long. 40° 52′ 57″ E.*), in the southern part of the bay, is 1½ miles northward of Ras Hanfela. It is covered with scrub, is 25 feet high, and has a pillar, the observation spot, on its north-western corner. From the spit off the south-western part of the island, a reef extends 4 cables in a south-westerly direction, having at its outer end a rock awash at low water. A channel with a depth of 6 fathoms separates the island from the mainland. On the western side of this channel, here only about 3 cables wide, is another shoal with a general depth of 2 fathoms, and a 6-feet patch at its western end.

A shoal with a least depth of 2 fathoms lies 1¼ miles north-westward from the western extreme of Daramsas. There are many shoals as charted.

A 6-fathoms bank of coral and sand, surrounded by depths of from 10 to 15 fathoms, lies 5 miles eastward of the island.

Anchorage.—There is good anchorage on the north-western side of Daramsas in 8 fathoms, sand, with the western point of the island bearing South one mile. In entering this anchorage, do not approach the island within 5 cables, as the 3-fathoms line is at some distance from its north-east extreme.

Harbour.—In the interior of the bay are two islands, Anto Kebir and Anto Seghir, more than one mile apart north and south. Both are surrounded by coral reef and connected with the shore by it near the village of Madr. From the northern end of Anto Seghir, the southern island, the reef extends nearly half way across to the northern island, leaving between the reefs of the two islands a 2¼-fathoms channel into the harbour, a snug anchorage for small craft, and with a pool north-westward of Anto Seghir, 5 cables long north and south, and 3 cables wide, with a depth of 3¼ fathoms.

Kutto islet lies 1½ miles south-eastward of Anto Seghir, and between these islands there is anchorage in 6 fathoms, but the ground in the vicinity is very irregular, with many shoal patches of from 2¼ to 3½ fathoms. On the western side of Kutto islet, is a shallow passage through the reefs, about 3 miles long in a south-westerly direction, leading into a small boat harbour with about 4 feet water in the mainland, the entrance points of which are only about 2½ cables apart, with Alet islet, on which is a small village, lying in mid-channel about a mile off the entrance.

General charts 81 and 2523.

Plan 733, Hanfela bay. Var. 2° 30′ W.

Tides.—It is high water, full and change, at Hanfela bay, at 1h. 21m.; the rise is, approximately, from 3 to 4 feet; the tidal streams are scarcely perceptible.

Ras Hanfela, the south-eastern point of Hanfela bay, is a coral point 35 feet high, with, no reef off it, which on a south-south-westerly bearing, makes as an island. Anchorage may be found in from 3 to 5 fathoms in a small bay, 5 cables westward of it.

Chart 143, Jebel Teir to Perim.

COAST.—From Ras Hanfela, the coast trends east-south-eastward 18 miles to Ras Shakhs. Ras Anrata is a low coral point, 4 miles south-eastward from Ras Hanfela, and has the appearance of an island close to the shore. Several shallow bays exist on this low sandy stretch of coast, but they are not visible from a passing vessel, the shore resembling one uniform line. *See* view on chart 143.

SHAB SHAKHS.—LIGHT (*Lat. 14° 38½′ N., Long. 41° 5′ E.*).—Shab Shakhs is an extension from the shore reef in a north-north-easterly direction from the position of the lighthouse, for a distance of 3¼ miles, with only 7 feet water at its extreme, and from 9 to 15 fathoms close outside it. The shoal does not show well and the depths outside give no indications of approach to it. The lighthouse stands on the shore at a spot known as Shab Shakhs point (though the coast-line is almost straight). It consists of a metallic tower, keeper's dwelling, and tripod, the latter painted white with a black band. From it is exhibited a *flashing white* light, visible 18 miles; the *flash* shows every *five seconds.*

Ras Shakhs, 5 miles south-eastward of Shab Shakhs lighthouse, is low and sandy, and is the point from which the general trend of the coast becomes more southerly; the point is not conspicuous, as a broad flat plain lies between it and the foot of the mountains. It is a dangerous point during the day in hazy weather, and was still more so at night until the establishment of Shab Shakhs light, as it cannot then be seen until close on board. The 5-fathoms line of soundings is at no great distance from the shore eastward of the point.

Directions, *see* page 250.

Caution.—The bottom is uneven and the 5-fathoms line of soundings varies its distance considerably from Ras Shakhs; caution is therefore requisite when approaching the shore for the purpose of anchoring.

General charts 8d and 2523.

Chart 143, Jebel Tier to Perim. Var. 2° 30′ W.

There is a 6-fathoms coral bank 9 miles northward of Ras Shakhs, and outside the 20-fathoms line of soundings. Beyond are the Seven-fathoms and Three-fathoms banks, mentioned on page 221, northern side of the fairway.

Inland features.—About 9 miles inland from Ras Shakhs, rises a mountain mass attaining a height of 3,300 feet at 18 miles from the sea. The range stretches many miles southward, but this is its northern limit, from whence it turns westward receding from the coast.

To a vessel approaching from the northward, the isolated mountian that shows most to the left is Jebel Kosar (*Lat. 14° 21′ N., Long. 41° 13′ E.*); it is 16 miles southward of Ras Shakhs, and is 2,300 feet high.

Jebel Anrata, 17 miles north-westward from Jebel Kosar and 1,950 feet high, is also conspicuous from both north and south, showing as a rounded summit on the eastern extreme of a flat ridge which falls abruptly towards the sea.

Some smaller peaks in the plain about 6 miles south-westward of Ras Shakhs, are conspicuous by their jagged shapes, and may often be seen when the higher and more distant mountains are veiled in haze.

The description of the coast from Ras Shakhs southward is continued at page 261.

The northern shore of the South Massawa channel will now be described, from abreast Massawa harbour, *continued* from page 229.

DAHALAK ISLAND is situated on the western side of Dahalak bank, the north-western portion of which bank is described with North Massawa channel, and the south-eastern portion with the South Massawa channel. The west extreme of the island forms the eastern side of the northern end of the Massawa channel which is named the Narrows and is described on page 237. Dahalak island is about 80 miles in circumference, and of extraordinary shape; its southern side from Seil Bayus to Ras Shoke, its south-eastern extreme, is 28 miles long, and its greatest breadth is 15½ miles. It consists principally of coral rock, interspersed with spots affording a supply of good grass in the rainy season.

The only animals seen on the island are asses, goats, sheep, and antelopes; the latter are numerous.

Villages.—There are eight towns or villages, viz., Dhu Bellu, Derbushat, Salat, Dahalak Kebir (at the south-western part of the island), Kubbani, Kunbeiba, Gembeli (the residence of the principal skeikh of the island), and Memla. Dhu Bellu, on the eastern side, has the principal trade and best appearance of any of the villages; most of the houses are built of coral

Chart 164, Massawa channel. Var. 2° 30′ W.

and thatched, others are built of loose stones, the outer walls, 10 feet high, with sloping grass tops, the plastered houses having square tops; there are also some huts made of coarse grass. For Dhu Bellu anchorage, *see* page 257.

The trade of Dhu Bellu is principally with Loheiya and Gizan; from thence they import jowari and dates, and give in return the produce of the pearl banks, such as fish, sharks' fins, the horny part of shell fish, turtle, and pearls. The water supply is stored in tanks, filled during the rainy season; there are also several wells about 2 miles westward of Dahalak Kebir, near the beach, surrounded by an embankment forming an irregular figure, about 200 feet across in the widest part During the rains there are also many fresh-water pools on the island. There are four mosques at Dahalak Kebir, of which two have domes, and also two burial grounds.

Aspect.—The land of Dahalak is generally low, but with a few very small hills on it, as follows:—Jebel Kusum, a coral mound on the north-eastern part of the island; Jebel Im Ium or Bluff, a conspicuous mound of wedge-shape, as seen from the anchorage in Ghubbet Soghra, lies eastward of Nakhra Khor island; and Imamak, a small piece of table-land, 3 miles northward of Nakhra Khor.

Plan 2161, Ghubbet Soghra.

GHUBBET SOGHRA or MUS NEFIT.—Depths (*Entrance, Lat. 15° 41′ N., Long. 39° 55′ E.*).—This large inlet recedes about 6 miles on the western side of Dahalak, its southern and only navigable entrance for shipping, facing the Massawa channel. The passage is about 1½ cables wide, with depths of from 6 to 8 fathoms and upwards increasing very quickly both within and without to deep water; it is about 2 miles long with a considerable curve, it being entered on a N.N.E. course, and opening out into the Ghubbet on an E. by S. course.

The general depth in Ghubbet Soghra is from 70 to 90 fathoms, though there is mostly anchorage all round the Ghubbet within a few cables of the shore.

Anchorage.—A vessel should anchor in about 6 or 8 fathoms, in the channel leading along the eastern shore of Nakhra Khor island which channel is bounded on the eastern side by Cockloft island and its shoals, the latter extend upwards of one mile in a south-south-easterly direction from a point on the northern shore and a great portion of them nearly dry.

A good berth is about 8 cables N.N.W. ½ W. from Cockloft island, in the inner part of the passage.

Cockloft island, 25 feet high, lies on the western edge of these shoals, about 5 cables from their southern extreme.

General charts 164, 8d, and 2523.

Plan 2161, Ghubbet Soghra. Var. 2° 30′ W.

The southern limekiln on Nakhra Khor, shown on the plan, cannot be seen from this anchorage, but the northern one shows out well. The Penitentiary also, near this spot, has ceased to exist.

There is anchorage also in Khor Soguri, about 1½ miles inside and southward of the entrance on the western side of the Ghubbet, in 10 fathoms; and, at about 3½ miles further southward in a long narrow khor in from 9 to 11 fathoms, sand.

Water.—The westernmost of the khors, or deep bights, is the most convenient for boats procuring water, which has to be brought in mussucks, and the ship should anchor as near as circumstances admit to expedite the watering.

Tides.—It is high water, full and changes, in Ghubbet Soghra at 1h. 51m.; springs rise 9 feet. The tidal stream runs rapidly in the entrance to the Ghubbet and a sailing vessel with its assistance may get in or out with but little difficulty; otherwise, with a fair wind only, for there is no room to work through.

Nakhra Khor island.—The northern side of the entrance to Ghubbet Soghra is the southern side of Nakhra Khor, which island is nearly 6 miles in circumference and of middling height, composed principally of coral rock, but interspersed with small valleys and low spots of good grass, and here and there a few dom trees; there is also a village near the southern shore, the houses of which are built of coral, without cement, and with grass tops. On the northern side of Nakhra Khor is another narrow and intricate entrance to Ghubbet Soghra only fit for boats.

Water of good quality can be obtained on the eastern side of Nakhra Khor island about half a mile from the beach, over a rugged road; it is therefore necessary to carry it to the boats in mussucks. Although there is always sufficient for the inhabitants, a vessel could not be certain of obtaining water here in the dry season. Goats can be procured.

There are three or four small islands in the shallow northern entrance channel on the north-western side of Nakhra Khor besides Cockloft island, already described, on its eastern side.

Entedebir is a coral island, about 100 feet in height, standing on the bank extending westward from Dahalak island, from which it is, however, divided by a shallow channel, 3 cables wide.

General charts 164, 8d, and 2523.

Plan 2161, Ghubbet Sóghra. Var. 2° 30′ W.

Ente-rahiya, a lower coral island, 25 feet high, lies a cable southward of Entedebir on the same bank; and Kundabilu, 30 feet high, is a small wooded islet one mile west-north-west of Entedebir. The bank is steep on its southern edge, but affords indifferent anchorage ground in 10 fathoms, with Kundabilu bearing N.E. by N. and the right extreme of Enterahiya S.E. by E.

Chart 164, Massawa channel.

Shab Raia (*Lat. 15° 43′ N., Long. 39° 50′ E.*).—Westward of Kundabilu and separated from it by a 7-fathoms channel, is this shoal, extending 2¼ miles from that island, nearly awash in parts, and with only 1½ fathoms on its extreme southern edge. A 9-fathoms patch lies 1¼ miles westward of this reef, with 50 and 90 fathoms close to it.

Anchorages.—North-westward of Shab Raia, and to within 1½ miles of Dar Ghulla, described at page 224, where the water deepens, there is anchorage on the bank which connects the islets in from 10 to 16 fathoms, sand. There is no anchorage in the bay northward of Kundabilu islet, but in Ghubbet Entatu, the next bay on the north-western side of Dahalak island, there is anchorage off the village of Kunbeibá; in the southern part of this bay is the village of Darsugar, with Gembeli, the residence of the principal sheikh, close at hand. Another anchorage is off Kubbani village, in 6 or 7 fathoms, on the northern shore.

Water of good quality can be obtained both at Kunbeibá and at Kubbani.

Ente-ara.—Proceeding southward from the entrance to Ghubbet Sogra, the first island met with, 4 miles from the entrance is Ente-ara, a small sandy islet 6 feet high, lying off the Dahalak shore, 8 miles east-north-eastward from Madote light-house on the opposite side of the approach to the Narrows. Though low, its beach shows very white in the sun. A channel 5 cables wide exists between its encircling reef and Seil Bayus reef, where a vessel may anchor; but the reefs on both sides must be approached with caution.

Seil Bayus is a small low black rocky islet close to Dahalak island, 3½ miles east-south-eastward from Ente-ara; the reef skirting the Dahalak shore here projects westward 2 miles towards the channel, turning in again sharply on the southern side of the islet to the shore and is fairly steep-to.

Dahalak Kebir (*Lat. 15° 36′ N., Long. 40° 0′ E.*).—**Reefs.**—This town is in the northern part of a bay of which the south-eastern point is a low projection known as Ras Kumbit. It is a small collection of huts with the domed tombs of two

Chart 164, Massawa channel. Var. 2° 30′ W.

sheikhs westward of them, and some good wells, with two or three dom palms. The bay affords no anchorage except to very small local craft. The shore fronting the bay and town is skirted by a reef extending a mile off, from thence eastward along the southern shore of Dahalak, and close to it the water is very deep. Ghidir-as-ale, Erfam, Eleaf, and several other small islands are on the outer part of the reef which borders the Narrows.

Dahalak reefs.—On the northern side of the South Massawa channel, eastward of the Narrows, these reefs, continued from Eleaf Islet, stretch half a mile off Ras Kumbit and trend east-south-eastward for 23 miles, with a tolerably straight edge, though much shoaler in some parts than in others.

Tree islets, 30 feet in hight, are two conspicuous wooded islsts 6 miles eastward of Ras Kumbit, and 1¾ miles within the edge of the reef.

Muserí (*Lat. 15° 29′ N., Long. 40° 19′ E.*) is a coral island 35 feet high, its western end 16½ miles eastward of Ras Kumbit, and 1½ miles within the edge of the Dahalak reef. The island is 3 miles long east and west and has a number of rocky islets on the reef off its south-eastern extreme.

Seil Anber lies 6 miles south-south-eastward from Ras Shoke, the south-eastern point of Dahalak island; it is a circular sandy islet 30 feet high, wooded, and surrounded by a reef. Between Seil Anber and Muserí, distant 4½ miles to the westward, is a channel a mile wide, with from 5 to 9 fathoms.

At 4½ miles S. by W. ½ W. from Seil Anber is a coral shoal with less that 6 feet, steep-to on all sides.

Charts 143, Jebel Teir to Perim, and 164, Massawa channel.

Bu-l-hissar (*Lat 15° 23′ N., Long. 40° 38′ E.*) is the south-eastern islet of the Dahalak group. It is low and sandy, about a mile long with a 4-fathoms rocky bank extending about 5 cables north-westward from it.

Shab Abu el Khosu, bordering the northern side of the fairway, is a large coral reef which shows well, 6 miles south-westward of Bu-l-hissar. One part on its northern edge dries when the sea is low. It is 3½ miles long on a north-north-westerly line, 2 miles wide, and steep-to all round, except to the southward, where a depth of 11 fathoms is found nearly a mile off the main reef. Its southern point is in lat. 15° 16′ N., long. 40° 33′ E., and bears N. ¼ E. 16½ miles from Beach hill on the southern side of the fairway.

General charts 164, 8d, and 2523.

Chart 143, Jebel Teir to Perim. Var. 2° 30′ W.

Shab Muhammed, also on the northern side of the fairway, is a coral bank with a least depth of 2 fathoms. It lies 13 miles north-eastward from Beach hill, is 3 miles long north-west and south-east and can be seen at some distance.

An 8-fathoms bank lies 6 miles south-eastward from the nearest part of Shab Muhammed.

Three-fathom banks.—At 18 miles S. 61° E. from the shoal part of Shab Muhammed is the west extreme of a coral reef with 3 fathoms water. The reef of 6 fathoms stretches away in a south-easterly direction and connects it with another 3-fathoms head, 5 miles from the former.

Seven Fathom bank.—At 3 miles farther south-eastward, with its southern edge 12 miles north-eastward of Ras Shakhs, is an extensive bank with 7 to 15 fathoms some 15 miles in length. This is known as the Seven-fathoms bank; it does not show. Neither of these banks has been accurately surveyed. The known dangers are described on page 261.

Chart 164, Massawa channel; and 143, Jebel Teir to Perim Island.

Directions. — South Massawa channel.—Vessels bound to Massawa from the south-eastward should make Shab Shakhs lighthouse, giving a good berth to the spit extending 3 miles from it. The three black cones, 410 feet high, of Jebel Maurekh, nearly 30 miles further in, are probably good marks. The fairway is about 6 miles off Shab Shakhs and Ras Maurekh, which leads about the same distance southward of Shab Muhammed and of Shab Abu el Khosu, thence direct for Shumma light. Discoloured water is charted in the fairway north-east of Fawn shoal, but it is probably an erroneous position of Fawn shoal (*see* page 238). Thence through the Narrows southward of Shumma island, and thence course may be shaped to pass 2 miles northward of Madote island light and Mujunia reef to Massawa harbour, or northward through the North Massawa channel, for which see directions on page 218. For proceeding from Massawa the above directions, of course, will be reversed.

By night, the *flashing white* light on Shab Shakhs point should be made, and then the same course pursued as by day. When Shumma island light is seen it will be an excellent guide, and the main channel should be taken, keeping within the *white* sector of Shumma island light.

NORTHERN and EASTERN ISLANDS, DAHALAK BANK.—The description of the Massawa channel just completed, having included the islands on the Dahalak bank bordering on its western and southern sides, commencing with

Chart 161, Massawa channel. Var. 2° 30′ W.

Difnein; that is to say, those, including Dahalak itself, which may be seen from, or which have to do with the navigation of, the Massawa channel; we now return to the northward, and starting again from Difnein, complete the description of this group with the northern and eastern islands.

Awali Shaura (*Lat. 16° 28′ N., Long. 39° 39′ E.*), lying east-south-east 20 miles from Difnein, is a small coral island about 1¼ miles long by half that width, on a sand and coral bank 17 miles long in an east-north-easterly direction by about 4 miles wide, at 3½ miles westward of Awali Shaura are some rocks 25 feet high, dark in colour and about 5 cables in extent; and 4 miles eastward from the same island, is a 2½-fathoms patch.

Awali Hutub, on the northern side of the sand and coral bank just mentioned, is 6 miles east-north-east from Awali Shaura. Like the latter, it is of coral and is small.

Harmil (*Lat. 16° 32′ N., Long. 40° 12′ E.*) is the north-eastern island on the Dahalak bank. From its eastern point, it extends south-westward about 5 miles, and is upwards of 13 miles in circumference. It is a low woody, sand and coral island, with a deep bight on its northern side, forming a shallow salt lake. About 2 miles eastward of its southern end is a sand-bank called Seil Harmil, and about 2 miles westward of its southern point is Enta-asnu, a small low and wooded, sand and coral island, surrounded by a reef. These islands occupy positions on a sand and coral bank, 11 miles in length, on which the soundings are very irregular, and under 10 fathoms. The south-eastern point of this bank, with 3 and 4 fathoms water, extends to within 4 miles northward of Enta-entor island.

Two shoal patches of 3 fathoms, each about 5 cables in extent, lie respectively 4¼ and 5 miles south-eastward of Seil Harmil, and another E. by N. 16 miles from that sandbank.

Outlying shoals.—A shoal of 4 fathoms lies in lat. 16° 51′ N., long. 39° 55′ E., and one of 5 fathoms, sand and coral, in lat. 16° 47′ N., long. 40° 11′ E. East 15 miles from the eastern end of Harmil island, in lat. 16° 33′ N., long. 40° 28′ E., are patches of 3 and 4 fathoms, with one of 5 fathoms S. by E. ½ E. 4 miles from the latter position. The bank should be given a wide berth.

Romiya, about 5 miles westward of Harmil, is a small and wooded sand and coral island. Between it and the bank of Harmil is a channel 2 miles wide, with irregular depths. West-north-westward from the island, 1½, 5, and 8 miles distant, respectively, are three dangerous rocky patches; the first with 3 fathoms, the second with 2 fathoms, and the

Chart 164, Massawa channel. Var. 2° 30′ W.

other with one fathom on it, on which last the water breaks in bad weather. There is also a breaking patch 8 miles westward from Romiya, and it is surrounded by several other banks of 2 and 4 fathoms; the water is deep near the island, and in fine weather the banks may generally be seen.

Asbab is a small low bushy coral island, surrounded by a bank 1½ miles southward of Enta-asnú with a channel of 13 fathoms between them. A sand and coral bank, commencing one mile westward of it, extends 7 miles in a westerly direction, and is 4 miles wide at its western end; its northern part is within 2 miles of the parallel of Romiya island, and it has patches of 2 fathoms; there is a deep-water channel between it and Asbab. A shoal, about a mile in extent, with from one to 2 fathoms lies from 3 to 4 miles south-westward of Asbab.

Hukale is a low bushy sand and coral island 4½ miles southward of Asbab, and 8 miles westward of Enta-entor; a reef, on which is a 2-fathoms patch, extends nearly 2 miles west-south-west from it, and a 7-fathoms patch lies 3 miles south-westward of the island.

Enta-entor (*northern end, Lat. 16° 21′ N., Long. 40° 14′ E.*) is a low bushy sand and coral island, with several shoals westward of it, viz., one 4 miles to the north-westward with 4 fathoms; another 3½ miles to the westward with less than 6 feet; and other shoal patches W. by S. 3 miles. This small island, has shoal water extending south-westward from it for 2½ miles, and a 2-fathoms patch is 5 cables from its extreme end. Between the shoal extending off the south-western end of Enta-entor and the reef extending northward from Ghabbi-hu, is a narrow 6-fathoms channel.

Isratu Seil Anber, 4 miles westward of Hukale, is a small wooded island, and 4½ miles westward of it is the large island Isratu. This latter island has on it some small peaked hills, and is one of the highest and largest on the Dahalak bank, being 13 miles in circumference, but nearly sub-divided by a small inlet on its northern side, which forms a salt water lake. The island is principally composed of coral rock and only affords a supply of firewood.

At 3 miles northward of Isratu is a patch of 2½ and 3 fathoms on the south-eastern part of a bank extending 3½ miles from thence northward, where there are 3½ fathoms, and 5 miles westward where there are 11 fathoms, with 45 fathoms close-to.

General charts 8d and 2523.

Chart 164, Massawa channel. Var. 2° 30′ W.

Wusta island, 2½ miles westward of Isratu, is 1½ miles long, rather high, and is of coral; there are small rocky islets eastward of its northern and southern ends, and a 2-fathoms patch between it and Isratu. Isratu and Wusta are both on the same sand and coral bank, which is 10 miles long east and west, and from 3 to 4 miles wide, with from 8 to 10 fathoms on its eastern part about 3 miles eastward of Isratu. There are from 5 to 7 fathoms between Isratu and Wusta, both eastward and westward of the two fathoms patch, and no bottom at 50 fathoms close to the south-western side of Isratu.

Tanam (*Lat. 16° 18′ N., Long. 39° 44′ E.*).- About 3½ miles westward of Wusta is Tanam island, 1½ miles in circumference, rather high, and with a small but remarkable peak. It is the largest islet of a rocky group lying westward, north-westward and northward of it. A rocky 2-fathoms patch lies 1½ miles southward from Tanam, and a patch, 1½ miles across, also with 2 fathoms but with many rocky heads of 6 feet or less, lies 3½ miles southward of that island.

Jerom.—About 5½ miles southward of Tanam is this little island, and 9½ miles southward from Tanam is Jarmat-ad-da, another of the same description; these are all on one bank. Its length north and south being about 11½ miles, and breadth, westward of Jarmat-ad-da, 9 miles.

Entufash, nearly 9 miles southward of Jerom, is a low sandy island, with a 2-fathoms shoal 2 miles north-eastward of it, and one-fathom patches one and 2 miles distant westward from it, in the direction of Umm Ali.

Umm Ali is 6 miles westward of Entufash, and is a small low bushy island of sandy formation. There appears to be deep water between the shoals encircling the two islands. Westward of it, and 3¾ miles distant, is Seil Badira, a small low rocky islet, not to be confused with the islet of the same name on Shab Harát, farther westward.

Abu Sherayir, Dahret, and **Malak** are three small sandy islands from 3½ to 5½ miles northward of Seil Badira; the first two are low coral islands covered with wood, having a 2-fathoms channel between them. A sandy spit extends from the southern end of Abu Sherayir, and eastward of it, about one and 3 miles distant, are two rocky patches; another lies about one mile westward, and another midway between this island and Umm Ali. Malak is a low sandy island, with some bushes, separated from the others by a narrow 8-fathoms channel; shoal water extends nearly 3 miles northward of this island.

General charts 8d and 2523.

Chart 164, Massawa channel. Var. 2° 30′ W.

Barádu.—About 3 miles southward of Seil Badira i Barádu, a low triangular island, 20 feet high, 3½ miles i circumference, with a few dom trees on it, which, togethe with Dohul, Bahut, Dahret, already described with those o the edge of the bank, are all on a bank of irregular sound ings, generally of from one to 12 fathoms, but with some rock heads almost awash, as will be seen by the chart.

Enta-idell (*Lat. 16° 7′ N., Long. 39° 50′ E.*), about 7 mile north-eastward of Entufash, and 11 miles westward from th northern point of Norah island, is a sandy and rocky island with a shoal patch a mile north-westward of it, and a dee channel between it and Norah.

Umm-es-Seil is 4½ miles south-south-east from Enta-idell and 5½ miles westward of the north-western point of Norah this also is a sandy and rocky island; it has a 3-fathoms shoa one mile north-westward of it, and a 20-fathoms channe between it and Norah.

Seil Bala, 3½ miles westward of Umm-es-Seil consists o high rocks.

Ento-ghodof-Adbára and **Adbára Kebir** are thre low sandy islands, from 7 to 9 miles westward from the south western point of Norah; they are on a shoal and rocky bank 4 miles long, north-east and south-west. At 2 miles south-west ward from the southernmost is a dangerous rocky one-fathon patch.

W. Dhu-l-bahur, Dhu-l-kuss, Dahret Dhubanet.—In a south-south-easterly direction from Adbara, at from 4 to 7 miles, are the small islands W. Dhu-l-bahur and Duh-l-kuss o one sand and coral bank, and Dahret Dhubanet on another There exists a channel of from 5 to 12 fathoms between them but it is too intricate to be considered navigable, nor is there any passage eastward of Dahret Dhubanet.

Dhu rijrij is a small low wooded island nearly midway between Dar Ghulla and Dhu-l-kuss; a reef extends 1½ miles southward from Dhu-rijrij, but there are channels on all sides of this island.

Sarad is a rocky island, of middling height, connected with Ras Dofueur, the north-west point of Dahalak island, by a shoal bank stretching off 3½ miles in a north-westerly direction, the island being 2 miles distant from the extreme point. Patches outlie the reef as charted.

Dhu-l-aham island lies 4 miles northward of Sarad, and about a mile north-west from Ras Antarlero, the northern point of Dahalak, with a narrow 2-fathoms passage between the

Chart 164, Massawa channel. Var. 2° 30′ W.

island and point. Between these islands is the entrance to Ghubbet Entatu, a deep bay in the coast of Dakalak, where there is anchorage, as already described at page 248.

Dhu-l-aham is a low sand and coral island, and has a reef on its western, northern, and eastern sides.

NORAH ISLAND (*North extreme, Lat. 16° 8′ N., Long. 40° 2′ E.*).—This, the second largest island of the Dahalak group, lies northward of Dahalak, and is separated from its northern part by a shallow space about 7 miles wide. The island is of sand and coral formation and has a few small date groves; it is about 12 miles long north and south, and 7 miles wide; its circuit, excluding bays, being 32 miles. There are two fishermen's villages on Norah; one on the south-western part, bearing the same name as the island, the other on the north-western part in a deep bay; the highest part of the island is westward of the village of Norah.

Water.—Good water may be obtained at the village in the north-western part of the island.

Norah stands on the north-western part of an extensive bank having over it from one to 2 fathoms water, by which bank it is connected with Dahalak. There are several other islands on the same bank which stretches so far northward, that, as before remarked, it leaves no channel across the Dahalak bank southward of Enta-entor.

Dhu-ladhiya, Dúrafrus, Seil Betta, and **Seil Norah.**—Dhu-ladhiya, west-south-west 3 miles from the south-eastern point of Norah; Dúrafrus and Seil Betta, about the same distance south-westward from the south-western part of Norah, and Seil Norah, lying rather more northward and less than a mile from the western part of Norah, are all rocky islets near the edge of the shoal bank of Norah, with deep water a mile south-westward and westward from them.

Jezírat Asghar, Seil Adasi, Norah Adasi, Dahret, Entvedul, and **Dhu-lalam** are all on, or near, the edge of the shoal bank of Norah, off the north-western and northern part of that island, from 2 to 6 miles distant from it. Some are low sandy islands, and others rather high and rocky, with bushes. A detached rocky shoal of 2 fathoms, with deep water around, lies S. by W. ½ W. 1¾ miles from the southern end of Jezírat Asghar.

Nahelej is a long low sand and coral island off the north-eastern side of Norah, from which it is distant 1½ miles. It is nearly 8 miles in length by 2 miles in extreme breadth, but is

Chart 164, Massawa channel. Var. 2° 30′ W.

almost sub-divided near the middle. About 7 miles eastward of its northern end is a 4-fathoms patch, having 14 fathoms near it.

Dahret Kubari, 1½ miles northward from the northern end of Nahelej, is a low coral island about a mile long. W. by N. ½ N. 3 miles from its northern end is a rocky 2-fathoms patch, having 8 and 9 fathoms near it.

Ghabbi-hu (*Lat. 16° 17′ N., Long. 40° 14′ E.*).—Nearly 2 miles north-eastward of Dahret Kubari is Ghabbi-hu, a low sand and coral island, with a few bushes on it; it is about 2½ miles long, north-east and south-west, but has an arm stretching 2 miles south-eastward from the main body of the island, and forming a bight on its eastern side. It is on and near the north-eastern extreme of the Norah island bank, which extends about a mile beyond its north-eastern end. The southern end of Enta-entor island, before described, is 2½ miles northward of the northern extreme of Ghabbi-hu.

Mahun, a low sand and coral island, 3½ miles long, east and west, and about 8 miles in circuit, lies east from the central part of Norah, the nearest point of which is a mile distant.

Dhu-l-fidol, also low, sandy, and of coral, lies 5½ miles south-eastward of Mahun. A bank of shoal water extends nearly 3 miles east-south-eastward from Dhu-l-fidol. Between Dhu-l-fidol and the nearest point of Norah, distant 9 miles, are several unnamed low sandy islands and banks.

Dhu-l-ankibat, 7 miles eastward from the south-eastern point of Norah and 3 miles south-westward from Dhu-l-fidol, is a low sandy island 1½ miles in extent, and is surrounded by a reef extending 3 miles east-south-east from it.

Martaban, a low sandy island 1½ miles long, lies 3 miles westward of Dhu-l-ankibat.

A shoal with less than 6 feet of water is situated 1½ miles to the southward of Martaban island.

Dhu-lalam, distant about a mile from the south-eastern point of Norah, is 3 miles long, north and south, and about one mile wide; it is low, sandy, and surrounded by shoal water. There is a fishing village on it, and two small sandbanks between it and Martaban.

Dergoman Seghir and **Dergoman Kebir.**—At 3 miles south-westward of Martaban are these two islands, the first a low sandy island, the other high and rocky, wooded on its south-eastern part. They are about 1¾ miles, apart and 1½ miles off the north-eastern point of Dahalak; they have shoal water all about them.

General charts 8d and 2523.

Chart 164, Massawa channel. Var. 2° 30′ W.

Akrab islands.—These are two low sandy islands, one lying 2 miles, the other 2½ miles southward of Dhu-l-ankibat.

Sayin island.—About 3 miles southward of the eastern Akrab is Sayin or Dhu-l-kos island, 2 miles long, rather high and rocky, and surrounded by shoal water, on the Dahalak reef. At 1½ miles from it, on the north-eastern edge of the same reef, is the little islet Dahret Dulke.

Seil Sikan is a high and barren coral island, 2½ miles north-eastward of Ras Kusum on the island of Dahalak, and 4 miles W. by N. ¼ N. from the south-western end of Sayin; it is narrow at the base, spreads out at the top, and is near the eastern edge of the bank forming the western side of the narrow channel leading to Dhu-Bellu anchorage.

Erwa (*Lat. 15° 42′ E., Long. 40° 12′ E.*) is a moderately high flat coral island, about 12 miles in circumference; it is separated from the north-eastern side of Dahalak by a narrow boat channel, and has on it a few fishermen's huts. On its southern side is a landlocked salt-water lake, 3½ miles long by 2 miles wide, with from 4 to 6 fathoms water; this is connected with the sea on the eastern side by the boat channel before mentioned, and, on the western side by a gut, with from 3 to 6 fathoms, leading into the anchorage off Dhu-Bellu and from thence to the sea.

Dhu-Bellu anchorage (*Lat. 15° 45′ N., Long. 40° 7′ E.*) is an oval opening in the reef about 2 miles south-eastward of the town. The narrow entrance to this place begins about a mile south-eastward of Seil Sikan island, where for a short space the two reefs nearly meet; after passing through this passage there is an open space about 2 miles in length, when the channel again becomes very narrow, and from thence the coast reef must be kept close on board in order to avoid the shoal part of the banks to the eastward. The channel is extremely narrow, and north-eastward of Dhu-Bellu there is very little more than one fathom in depth, and that over rocky bottom; elsewhere the depths in the channel are from 4 to 7 fathoms, and in the anchorage, from 3 to 6 fathoms. The rush of tidal water through this channel in and out of the large salt-water lake southward of Erwa is of considerable force at times.

Derom lies 6½ miles eastward of Dhu-l-ankibat. It is a small low sandy island, on the centre of a shallow bank nearly 6 miles long, of which the southern edge is within 5 cables of the southern point of the island, but, from thence, it extends 3½ miles eastward and nearly 2½ miles westward.

General charts 8d and 2523.

Chart 164, Massawa channel. Var. 2° 30′ W.

There is also a shoal rocky patch 3½ miles north-eastward of Derom.

Dha-n-nafarik is a small but high rocky island 3 miles southward of Derom; it is on a rocky bank extending north-west one mile, and south-west 2 miles from the island.

Seil Arabi is 2½ miles distant from the Dahalak shore, and lies 4½ miles south-westward from the southern point of Dha-n-nafarik. This is a small but high rocky island of coral formation, surrounded by shoal water, but with a 7-fathoms channel between it and the Dahalak reef. At 1¾ miles north-north-east from Seil Arabi is a small rocky patch; another lies north 2¾ miles from the same island, and a third 5 cables from its north-western shore.

Yermalkau is an islet surrounded by reef, 4½ miles south-eastward of Seil Arabi; and 4½ miles eastward of Yermalkau is Senach island, also surrounded by reef. About 2 miles northward of Yermalkau is a shallow rocky patch.

Dhu-lakal (*Lat. 15° 45′ E., Long. 40° 29′ E.*).—This island lies 2 miles north-eastward of Senach, Gharib lies 3 miles north-westward from it, both are low sandy islands lying on the same shallow bank, which is 6 miles long in a north-westerly direction, and nearly 2½ miles wide.

Dhu-l-kuff lies 3½ miles north-eastward of Gharib, and is a low sandy island with a few bushes on it. A wide reef extends north-eastward from it; and one mile westward from its western end is a large rocky patch.

Dhu-l-bia is a small low sandy island surrounded by shoal water, extending 2 miles southward of the island. About 3 miles east-south-east from it is a shoal rocky patch.

Bilha, about 6 miles eastward of Dhu-l-bia, is a low sandy island about 1½ miles long, on a dangerous shoal extending 4½ miles north-eastward and 1¼ miles south-westward from the island.

Hawatib and **Hawatib Kebir** are two low sandy and bushy islands, lying 4 and 5 miles north-eastward from Dhu-l-kuff. Shoal water extends upwards of a mile eastward from Hawatib Kebir, and a 3-fathoms shoal lies 6 cables from its south-western part.

Shoals.—About 5 miles eastward from the same island is a 2-fathoms shoal, and one mile farther, nearly on the same line, is another with 3 fathoms least water. At 8½ miles

Chart 164, Massawa channel. Var. 2° 30′ W.

north-eastward from the eastern end of Hawatib Kebir is a shoal rocky patch, outside all the islands in this vicinity; its centre is in lat. 15° 58½′ N., long. 40° 43° E.

At about 7 miles west-north-westward of this patch is one with 3½ fathoms on its western extreme.

In lat. 16° 10′ N., long. 40° 43′ E., is a patch of 5 fathoms, and probably less, surrounded by depths of 22, 19, and 9 fathoms.

Dhu-nishub (*Lat. 15° 43′ N., Long. 40° 32′ E.*).—About 5½ miles southward of Dhu-l-bia is Dhu-nishub, a low sandy island with only a narrow fringing reef around it.

Rijyuma is 4 miles eastward of Dhu-nishub, with Maharib about 2 miles southward of it; both are small low islands surrounded by reef, that around Maharib being very narrow.

Raka, a low sand and coral island, with a bluff of bushes on its eastern end, lies about one mile eastward of Rijyuma.

Tor island, about 7 miles eastward of Ras Shoke, about 6 feet high and rocky, with a break in parts towards the eastern end converting it into two islands at high water, it is about 2 miles long, east and west, and one mile wide. The reef extends eastward and westward, and for some distance on its southern side where a large portion dries at low water; there is good anchorage, in about 5 fathoms, within 5 cables of the shore on the north-western side.

Umm-en-Nayim, Darraka-el-Bahr and Darraka-el-Barr.—Umm-en-Nayim is at the north-western end of a reef 3½ miles in length and very shallow, its extreme being 9 miles eastward of Ras Shoke; Darraka-el-Bahr, 5½ miles from Ras Shoke, is surrounded by reef; and Darraka-el-Barr is 2½ miles north-eastward of Ras Shoke and on the Dahalak island reef. All these islands are low and sandy.

Howeit island, encircled by reef, is 4½ miles south-eastward of Ras Shoke, the south-eastern point of Dahalak.

The islands southward are described with the South Massawa channel.

Chart 8d, Red sea, sheet 4.

Seghala (*Lat. 15° 45′ N., Long. 40° 41′ E.*), about 4 miles north-eastward of Raka, is about 3 miles long and one mile wide, its northern side forming a bight. It is a low sandy and bushy island on a shallow bank extending from 1¾ to 2½ miles from its northern side, and one mile south-eastward from its eastern end. From observations made by H.M.S. *Dolphin*, in 1887, there appears to be a rise and fall of tide of about 3 feet at this island, but no perceptible tidal stream.

General charts 8d and 2523.

Chart 143, Jebel Teir to Perim. Var. 2° 30′ W.

Dahret Seghala, a low sandy and bushy island, about one mile long east and west, and having a reef extending a mile from its northern side, is 3 miles southward of Seghala.

Mustamila is 3 miles south-westward of Dahret Seghala; it is a small high sandy island, with a reef extending a mile north-eastward, and also round its northern side and western end.

Zauber (*Lat. 15° 38′ N., Long. 40° 46′ E.*), about 2½ miles southward of Dahret Seghala, is also a high and sandy island, with a reef extending a mile northward and westward from it.

Salima is a high rocky island about 2½ miles long east and west, and about a mile wide. It lies 3 miles southward of Zauber and has a narrow reef on its northern side.

Hatitau is 3½ miles westward of Salima. This is a high rocky island about 2 miles long, north and south, and one mile wide, with a reef on its eastern side. About 3 miles westward of its northern end is Tor island.

Mojeidi (*Lat. 15° 30′ N., Long. 40° 50′ E.*) is the south-easternmost island on the Dahalak bank; it is a high rocky island about 1½ miles long, north and south, and nearly a mile wide.

Aucan.—About one mile westward of Mojeidi is Aucan, also a high rocky island about 3½ miles long in a west-south-west direction, and one mile wide; it has but little reef around it.

Dhu-l-kurush, westward from the southern end of Aucan and separated from it by a 12-fathoms channel, 1½ miles wide, is high and rocky, of triangular shape, and surrounded by a reef.

Mashilagha, a small but high rocky island surrounded by reef, widest on its south-eastern side, lies 5½ miles north-eastward of Bu-l-hissar island described with the South Massawa channel, and nearly 2 miles south-south-west from Dhu-l-kurush; there are depths of 40 to 53 fathoms between the two first-named, and from 12 to 20 fathoms between the latter.

Shab Ali.—There is water of a navigable depth, from 5 to 15 fathoms, between all the islands and their reefs south-eastward of Derom, on the Dahalak bank, that have been described, but vessels approaching from the eastward must be careful to

Chart 143, Jebel Teir to Perim. Var. 2° 30′ W.

avoid the shoal and dangerous bank, extending eastward of Shab Ali. Its south-western end lies about 4 miles eastward of Zauber, and from thence it, and the bank of which it forms a part, extends 10 miles eastward and about 10 miles in a north-north-west direction approaching within 2 miles of Dahret Seghala, with from 9 to 15 fathoms close to its western edge. The portion charted as Shab Ali is, in its widest part, about 2 miles across, but the bank on which it lies is about 9 miles wide, having 17 fathoms close to its eastern edge; it has several patches, and various depths on it, which, as well as the depths between the islands, will be best understood by consulting the chart.

South-eastern dangers.—South-eastward from Shab Ali bank, at distances, respectively, of 3 and 9 miles from its south-eastern point, are patches of 3 fathoms shown on the chart, the more distant of which is in lat. 15° 29′ N., long. 41° 5′ E.; this reef (1903) was reported to have as little as 9 feet in places, and it has been seen to break with a moderate sea on.

A reef on which S.S. *Neghiled* struck in 1902 is charted in lat. 15° 22½′ N., long. 41° 4′ E.

Besides these, there is a cluster of shoals near the south-eastern extreme of the Dahalak bank, the outer one of 4 fathoms being 31 miles S.W. by W. from Jebel Teir island. About 5 miles west-north-west from this shoal is a 2-fathoms patch. From this will be seen the necessity for the caution enjoined at page 220.

The description of the Dahalak bank, with its innumerable islets, reefs, and shoals, being now completed, that of the western shore of the Red sea is again taken up, commencing from Ras Shakhs, the point at which it had arrived at page 245.

COAST.—General remarks.—From Ras Shakhs, the coast takes a south-easterly direction for 47 miles, to the bight, at the head of which is the village of Eid. It then takes a more easterly direction for 35 miles to Rakhmat island, but with two deep indentations within this space. It then resumes a general south-easterly direction for 90 miles to the large strait of Bab-el-Mandeb, this length of coast again being broken by the two deep bays of Beilul and Asab.

Aspect.—Mountains.—In the whole space here mentioned, the background consists of ranges of high volcanic mountains sloping down to the sea. In the northern part, north-westward of Ras Sirbut, is the highest of the near range

Chart 143, Jebel Teir to Perim. Var. 2° 30′ W.

of hills, with an eminence at each extreme; the highest part is seen from a little below Hanfela to a little northward of Eid. Jebel Kosar, 2,300 feet high, and previously described at page 245, lies 9½ miles south-west from Ras Kosar. A lower peak is on the same line of bearing from Jebel Kosar, and 2 miles nearer the point; on a westerly bearing the two show as a double peak.

Rugged peak is about 5 miles south-eastward of Jebel Kosar, and has a broken irregular top, with a sharp small point on its western part; it is, however, not very distinguishable from the northward.

Ras Sirbut (*Lat. 14° 16′ N., Long. 41° 29′ E.*) is 33 miles south-eastward of Ras Shakhs. Between these two places the water shoals gradually towards the shore, with the exception of a 4-fathoms patch 2 miles from the shore, and about 5½ miles north-westward of Ras Kosar.

JEZÍRAT KURDUMIYAT (*Lat. 14° 7′ N., Long. 41° 39½′ E.*) is a rugged bluff volcanic island about 180 feet high and 8 cables in diameter; it lies 13 miles south-eastward from Ras Sirbut, and its inner side is 2½ miles distant from the shore. In coasting from the north-westward, it is the first island met with after passing Daramsas island off Hanfela bay, a distance of 60 miles.

A rocky spit extends 1½ miles, off its western end, leaving a channel with depths of 5 to 9 fathoms between it and the shore. There is a rock on the reef about 10 feet high.

At 1½ miles south-south-westward from Kurdumiyat are three small rocky islets, 100 feet high, on one shoal bank. Between these islets and Kurdumiyat is a channel with about 4 fathoms, and between the islands and the shore, a narrow passage with from 5 to 6 fathoms.

Under the lee of Kurdumiyat, anchorage may be found, with the west extreme of its reef bearing East one mile.

Water.—During the rainy season, good water may be had on the mainland from a valley nearly opposite Kurdumiyat.

Plan, Eid road, on sheet 14.

EID (*Mosque, Lat. 13° 55′ 58″ N., Long. 41° 42′ 39″ E.*).—This village stands on the sandy plain in the western bight of the coast, 10 miles southward of Jezírat Kurdumiyat; it consists principally of grey oblong huts, with arched tops and an outer covering of coarse grass mats; there are a few small white stone buildings at the northern end of the village, and a small mosque and minaret at the southern end. It is of no great extent, but has a considerable trade with Mokha in mats, rafters, ghi, and goat-skins.

General charts 8e and 2523.

Plan, Eid road, on sheet 14. Var. 2° 30′ E.

Anchorage.—Depths.—The bay is shallow but with very regular soundings and no dangers. There is anchorage in 4 fathoms, with the mosque bearing S.S.W. ¼ W. nearly 1½ miles distant, and Carbone point, the eastern point of the bay, S.E., or nearer the village, according to the draught, where there would be better shelter. The water shoals gradually in approaching the bay.

Good cattle may be had here by waiting a day or two, but the water is brackish.

Chart 143, Jebel Teir to Perim.

About 3 miles eastward of Eid, is a similar but narrower bight to that in which Eid stands, the land between the bights forming a square rocky lava headland of dark colour from 30 to 50 feet in height with regular soundings off it.

JEZÍRAT KAD ALI (*Lat. 13° 56′ N., Long. 41° 49′ E.*).—This, the westernmost of two islands of the same name, is 150 feet high and not much more than half a mile in diameter; it lies 13 miles south-eastward of Jezírat Kurdumiyat, and is 1¾ miles from the shore, with which it is connected by a spit of sand and rocks with about 3 fathoms over it, and extending nearly a mile seaward beyond the island.

The eastern island, 80 feet high, lies east-south-east 2 miles from the other, and is steep-to.

Shoal.—About 2½ miles westward of Jezírat Kad Ali, and 1½ miles off-shore, is a shoal of 5 fathoms; other patches may exist, as the chart shows but few soundings.

Kad Ali spit is said to extend towards this patch farther than is charted.

Barn rock, 10 feet high and almost steep-to, lies 2½ miles north-east from the western Kad Ali island. There is apparently a 20-fathoms channel between them.

Aspect.—Haycock hill, 833 feet high, is a mile inland about 7 miles south-eastward of the Kad Ali islands. Close east-north-eastward from the Haycock are two other hills, also conical, but not quite so high; the three appear as one on a west-south-westerly bearing. About 3 miles south-eastward from Haycock is Round hill, 586 feet high, and 3 miles farther south-eastward is a conical hill; about 3 miles eastward from the latter is Ras Sherayir.

JEBEL ABAYIL ISLANDS (*Lat. 13° 53′ N., Long. 41° 58′ E.*).—Saddle island, the western island of the two, is 403 feet high; both islands lie adjacent to the shore near Haycock hill. Saddle island is so named from its having a saddle-

Chart 143, Jebel Teir to Perim. Var. 2° 30′ E.

topped hill on its eastern end; it is separated from the mainland by a narrow channel fit only for boats.

The eastern and larger island, Jebel Abayil, has three hummocks, the western one being 388 feet high; both islands are volcanic. Between Jebel Abayil, which is encircled by a reef, and the shore, 1½ miles distant, there are said to be depths from 12 to 17 fathoms, and 17 fathoms between the two islands; but these channels are much narrowed by the eastern island's reef.

Scilla bank, more than 3 miles westward from Saddle island, and its inner end only a mile from the shore extends from thence about 1¼ miles in a northerly direction, with a depth of 3¼ fathoms; this bank lies well in-shore of a line connecting Saddle island with East Kadi Ali island. Between this bank and the promontory on which Haycock hill stands is a considerable bight with apparently deep water half-way in, and from 4 to 6 fathoms near its head.

Anchorage.—Westward of the Jebel Abayil islands, off the entrance of this bight, is good anchorage in 7½ fathoms, with Haycock hill bearing S. by E., and Saddle island E.N.E. The anchorage northward of these islands is also reported to be good, with smooth water, during southerly winds. There is good seining on the flood tide.

Button rock, or Seïl Abelat, 58 feet high, is 2½ miles south-eastward of Jebel Abayil island.

Ras Sherayir (*Lat. 13° 46′ N., Long. 42° 1½′ E.*) rises directly from the shore and is a remarkable brown volcanic hill, with a flat top, about 200 feet high; near it, on the southern side, is a sand-hill.

Sharp peak.—At 17 miles south-westward from Ras Sherayir is a very remarkable conical mountain about 5,403 feet high; about 5 miles south-south-westward from this is another, 5,083 feet high, with a sharp peak on its south-western end; and 7½ miles farther again, nearly in the same direction, is a smooth-topped mountain 6,990 feet in height, and 27 miles inland from the nearest part of the shore southward of Ras Sherayir.

Plan, on sheet 923, Rakhmat anchorage. Var. 2° 30′ W.

Coast.—From Bahr Assúb, about 3½ miles south-eastward of Ras Sherayir, the coast trends south-south-east about 6 miles, and then east-north-east 6 miles to the eastern extreme of Rakhmat island, forming a bay, off and in which are many rocks and islets, as presently described; the general depths within

Plan, on sheet 923, Rakhmat anchorage. Var. 2° 30′ W.

the points mentioned are from 4 to 5 fathoms, and it has good anchorage ground in those and in greater depths further out.

Quoin islands (*Lat. 13° 45′ N., Long. 42° 9′ E.*).—Lying in the approach to Rakhmat island anchorage, and 6½ miles eastward of Ras Sherayir, is the Quoin group of three small white rocky islands lying in the form of a triangle and about one mile distant from each other. The North-west Quoin is 175 feet high, the westernmost and highest of the group. The North-east Quoin is 153 feet high, and the South Quoin is 79 feet high.

Quoin rock lies S.W. by W. 1¼ miles from the South Quoin, dries one foot at low water, and can generally be seen. All these rocky islands have from 4 to 5 fathoms water close to, increasing rapidly to 7 fathoms and upwards. The Quoin rock is the nearest of the group to the shore, from which it is distant 3 miles.

RAKHMAT ISLAND (*Summit, Lat. 13° 40′ 27″ N., Long. 42° 12′ 37″ E.*).—This island is the easternmost and highest of a chain of islets and rocks mostly connected with each other, and nearly so with the shore at low water; they form the southern side of the bay known as Rakhmat anchorage.

The islets and rocks from a distance have the appearance of being a continuation of a range of hills extending in a north-easterly direction from the high land to the shore.

Rakhmat is nearly a mile in length north-west and south-east; its summit is 282 feet high and appears double when viewed from the north-eastward.

Rocky patches, on which the depth is less than 3 fathoms, extend 5 cables from it in a northerly and north-easterly direction. Also, at 1¾ miles north-eastward from the summit of the island, is a 4¾-fathoms patch of coral and sand, with deeper water between it and the island.

Williamson island, 159 feet high, lies 5½ miles westward of Rakhmat island, and about one mile from the shore abreast of it, from which shoal water extends 6 cables towards the island; a shoal with 1½ fathoms also extends 5 cables southward from the island, leaving a channel nearly 3 cables wide with depths of 3¾ to 4 fathoms, between the shore and island reefs.

Bird island, 38 feet high, is 1⅓ miles eastward of Williamson island; it has from 3 to 4 fathoms a cable distant from it all round.

With the exception of one little rocky islet 32 feet high, bearing W. ½ N. 2 miles from the summit of Rakhmat, the

Plan, Rakhmat anchorage, on sheet 923. Var. 2° 20′ W.

other islands of the bay all lie on the shore bank westward of Rakhmat island.

East island, 203 feet high, its highest point, 3¾ miles westward of Rakhmat summit, has shoal water of 3 fathoms extending 5 cables northward from it; but, on its north-western side, there are 3½ fathoms within 1½ cables of the beach. At 6 cables eastward of East island is the western point of another island, unnamed, but 1¾ miles in length, with several peaks more than 100 feet in height, and connected by a sandbank, dry at low water, with Rakhmat. This island fronts the shallow entrance to a lagoon extending about 7 miles south-eastward, and having depths of from 1½ to 2½ fathoms.

Half a mile nearly from the northern shore of this island are two rocky islets, 156 and 153 feet high, distant 3 and 6 cables respectively from the little islet first mentioned.

Anchorage.—There is good anchorage in the bay westward of Rakhmat island anywhere in line between that and Bird island, in from 3½ to 4½ fathoms. Southward and south-westward of Bird island, or south-eastward of Williamson island, the anchorage is in 3½ to 4 fathoms; these anchorages afford good protection during southerly or south-easterly winds. For shelter against north-westerly winds, there is anchorage for small craft close under the south-east extreme of Rakhmat island in 4 fathoms. In approaching this latter anchorage keep the island close aboard, and anchor with the point N.E. in 4 fathoms. Westward of that position the water shoals rapidly to 3 and 2 fathoms.

Water.—In the bay westward of Ras Rakhmat and southward of East island, are two wells; the nearest is brackish, the other better; a moderate supply may be obtained. There is neither village nor huts near the wells.

Chart 143, Jebel Teir to Perim.

COAST.—Black hills.—From Rakhmat island the coast trends in a south-south-easterly direction 29 miles to lat. 13° 13′ N.; it then takes a more easterly direction for about 6 miles, and then north-eastward for 4 miles to Ras Beilul, the bight thus formed being Beilul bay. The first portion of this coast is low, sandy, and fronted by a coral reef varying in width from a few yards to 7 or 8 cables. From the beach, a flat desert extends a considerable distance inland; the only rising ground anywhere near the shore, visible to a passing vessel, being the Black hills, 110 feet high, in lat. 13° 27½′ N.

Patches.—A patch of 2½ fathoms is situated in the bight eastward of the Black hills, and there is a similar patch at 4 miles southward of it, both within a mile of the shore; which

Chart 143, Jebel Teir to Perim. Var 2° 20′ W.

is fronted by reefs to the distance of half a mile in places. The slope seaward is fairly gradual to the 20-fathom contour.

Plan, on sheet 923, Beilul bay.

RAS BEILUL (*Lat. 13° 14′ N., Long. 42° 33′ E.*).—This prominent peninsula terminates north-eastward in the Ras 100 feet high. At one mile W. by S. ½ S. from it is a conspicuous hill 317 feet in height sloping away south-westward and fronting Beilul bay; it forms the north-western head and highest part of the Beilul promontory. At 3¼ miles south-westward from the summit of this hill is a large white sand drift on the side of the range facing the bay; it marks the head of the bay in the peninsula and is an excellent landmark by night or day.

At about one mile westward of this sand-drift, the hills rise to a height of 585 feet within three-quarters of a mile of the shore; westward of these hills are lower black lava hills, followed by a flat clayey plain in the western part of the bay.

BEILUL BAY (*Observation spot, Lat. 13° 12′ 23″ N., Long. 42° 31′ 17″ E.*) is easily recognised when approached from the northward by the remarkable white sand-patch just described; the centre of this patch bearing S. ½ E. is a good leading mark into the bay.

Shoals.—Depths.—The head of the bay within the peninsula is upwards of 7 miles wide east and west. On the south-east side is White islet, 44 feet high, on a spur of the shore reef. At 1½ miles W. by N. from White island is a reef 4 cables in length with 2½ fathoms water, and from 8 to 9 fathoms close to its northern edge.

Another and larger reef lies in the middle of the bay, its northern extreme lying west-north-west from the high inner point of the Ras, and distant 5 miles from it. From its northern end, this shoal extends southward 2 miles, with an average width of one mile, and has depths of from one to 2½ fathoms; off the northern part of it eastern side, and 4 or 5 cables distant, are two patches of 3 and 2¾ fathoms; off its southern edge at about the same distance, are two similar patches of 2¼ and 1½ fathoms. These off-lying patches reduce the width of the channel between the shoal and the mainland to about 9 cables, in which are depths from 7 to 9 fathoms, mud.

Irregular soundings prevail on the western side of the bay, about 9 miles westward of Ras Beilul; here, shoal patches of 3 and 3½ fathoms lie 1¼ miles from the shore; one mile north-eastward of them, and 13 miles from the shore, is a 43-fathoms patch.

General charts 8e and 2523.

Plan, on sheet 923, Beilul bay. Var 2° 20′ W.

Anchorage.—Beilul bay affords excellent protection from the strong south-easterly winds so frequently experienced in winter, but is quite open and exposed to those from the northward. The best anchorage is the eastern portion of the bay in about 8 fathoms, with the high western summit of Ras Beilul bearing E. by N. ½ N. 1¼ miles, and White island S.W. ½ S. about the same distance. Dhows anchor in the western corner of the bay.

There is neither town nor village near the shore in Beilul bay. The village of Beilul is 7 miles inland from the eastern side of the bay and communicates by road with the Italian settlement at Asab.

Beilul bay abounds with excellent fish. Firewood suitable for steaming purposes may probably be found close to the shore.

Chart 143, Jebel Teir to Perim.

Sayal island.—*See* Chap. IV., page 137, for the description of this island, and in the preceding pages of that chapter for the other islands lying in the track of steam-vessels proceeding up or down the Red sea.

COAST.—From Ras Beilul south-eastward, until abreast of Sanah-bor island the shore is low and fringed by reef extending seaward upwards of a mile; the soundings decrease with regularity as the reef or shore is approached as far as that island. From thence the coast consists of a succession of sandy beaches with a low rocky shore between.

Aspect.—Hills.—About 26 miles westward of Ras Beilul, on a range of mountains, are two remarkable heights near each other, named Barn hill and Chimney peak, from their supposed resemblance to those objects; they are not charted and are therefore useless as sea-marks.

Jebel Auali or Asab hill (*Lat. 12° 57′ N., Long. 42° 26′ E.*), south-south-west 18 miles from Ras Beilul, is 3,211 feet high, and is the highest in that neighbourhood; from it, a range with well defined and conspicuous peaks extends eastwards towards Sanah-bor island and Asab; it is also connected with the high land round Beilul bay.

Jebel el Takhi, 983 feet high, is of conical form, standing well forward on the shore and at about 4¼ miles west-south-west from the Sanah-bor island.

Saddle mount, 883 feet high, is dark and very conspicuous; it is 3 miles southward of Ras Luma, the western point of entrance to Asab bay. High Saddle is about 10 miles westward from the Small Saddle, and resembles it in some views but is much more towering, being 2,275 feet high, and forming part of

Chart 143, Jebel Teir to Perim. Var. 2° 20′ W.

the higher inland range, which, commencing with the Small Saddle, increases in height westward until it culminates in Jebel Aduali or Asab hill. Beach hummock, 840 feet high, is the larger of two conical hills south-westward of Asab bay.

Plan of Asab bay on chart 8e. Var 2° 0′ W.

Sanah-bor (*Lat. 13° 5′ N., Long. 42° 42′ E.*) is a small round island, 277 feet high, 13 miles south-eastward of Ras Beilul and 1¼ miles northward of Ras Dugai, which latter is only 2 miles north-westward of Ras Luma, the western point of entrance to Asab bay. The island is surrounded by a coral reef, extending 5 cables on its northern side, and nearly a mile to the southward, leaving a narrow channel with from 6½ to 7 fathoms between it and the shore.

At one mile south-south-eastward from Sanah-bor and half a mile off shore, is a small isolated patch of 1¾ fathoms.

Two dangerous shoals, the Bosanquet and Fieramosca, lie off the northern and principal entrance to Asab bay; and another, the Scilla shoal or ridge, off the Rubattino or eastern channel. Before proceeding to a description of Asab bay, these outlying shoals demand attention.

ASAB BAY APPROACH.—The following dangers lie in the approach to Asab bay from the northward.

Bosanquet shoal lies in the fairway and is not marked by discoloured water. It is a small 3¼-fathoms patch of coarse sand and broken shells about 3 cables in extent, with depth of 8 to 9 fathoms close-to all round it. From the shoal, the summit of Sanah-bor island bears W. ½ S. 4¼ miles; and the western extreme of Jezírat Fatma, S.E. by S.

Fieramosca shoal, situated 3½ miles east-north-east of Bosanquet shoal, is a circular patch of coral about 9 cables in diameter, with a least depth of 2½ fathoms near its north-eastern edge, and with from 3 to 5 fathoms on the remainder of the shoal; within a short distance on all sides are from 12 to 15 fathoms. From the shoalest spot Ras Fatma bears S. by E. ¾ E. 5 miles, and Sanah-bor island W. by S. ½ S.

ASAB BAY (*Flag-staff, Lat. 13° 0′ N., Long. 42° 44′ 45″ E.*).—The entrances to this bay lie between Ras Luma on the west, and the islands extending north-westward from Ras Sintiyan, a low sandy and swampy cape on the east; the bay recedes about 16 miles in a south-easterly direction, and is upwards of 5 miles wide; it affords excellent anchorage and shelter from all winds for all classes of vessels using the northern entrance. (*See* page 271.)

General charts 8c and 2523.

Plan of Asab bay on chart 8e. Var. 2° 20′ W.

Besides the two large islands, Haleb and Jezírat Fatma, which, with other smaller ones, form the eastern side of the bay, many small low islands lie within the entrance and in the middle of the bay, with short channels between them from 5 to 10 cables wide. These islands effectually shut out all swell from the bay, though, during the North-east monsoon, when strong south-easterly winds prevail in the day, there is generally enough sea to be inconvenient for boats.

Nearly the whole of Asab bay is fringed by reef, which, towards the head, extends nearly 3 miles from the shore; on it, and near its edge, are six small islands, mere sand cays, covered for the most part with cactus and other rank vegetation, and destitute of fresh water. All round the margin of the inner part of the bay, the ground is low, swampy, and muddy, high tides inundating the low grounds.

Northern entrance.—Depths.—The width of this, the main entrance, between Asab settlement and Jezírat Fatma, is 5 miles, and the depths, when inside the Bosanquet shoal, are very regular, from 9 to 12 fathoms; but 5 cables within a line connecting Rus Luma with the northern side of Fatma, a large shoal or middle ground of from $1\frac{1}{2}$ to $3\frac{3}{4}$ fathoms occupies the central space; on its inner part are the two islets Umm-el-Sciora and Heri. This mass of shoals is $2\frac{1}{2}$ miles long, north and south, by $1\frac{3}{4}$ miles wide; they leave a channel $1\frac{1}{2}$ miles wide between them and Fatma, with depths of about 8 fathoms and 2 miles wide between them and the Asab shore with depths of 9 to 10 fathoms; the latter, the western, is the best and clearest channel by which to enter the bay.

LIGHTS.—On Ras Buja, at the settlement, from an iron structure, 26 feet high, is exhibited, at 68 feet above high water, a *fixed white* light, visible 10 miles, between the bearings, approximately, N. 18° E. and S. 22° E.

A *fixed red* light is shown from the outer extreme of the mole.

SCILLA SHOALS (*Lat. 13° 2′ N., Long. 42° 58′ E.*) lies in the approach to Rubattino channel. The northern end of these shoals bears North $4\frac{1}{2}$ miles from the beacon on Ras Makaua; from thence they extend south-eastward fully 6 miles, forming a ridge of sand and coral with heads of $2\frac{3}{4}$ and 3 fathoms and depths between of 4 and 5 fathoms; in hazy weather they should not be approached from seaward within a depth of 20 fathoms. A 3-fathoms patch near the south-eastern end of the shoals bears E. by N. $\frac{1}{2}$ N. about $4\frac{1}{4}$ miles from Ras Makaua beacon.

General charts 143, 8e, and 2523.

Plan, Asab bay, on chart 8e. Var. 2° 20′ W.

The current runs strongly in the vicinity of the Scilla shoals and generally parallel with the line of the ridge, but at certain times there is an inclination towards them, to which the attention of the mariner is drawn.

A bank of sand and shells, about half a cable long and a quarter of a cable wide, lies near the edge of the shore reef on the southern side of the approach to Rubattino channel, with as little as 6 feet water; from it, Ras Makaua beacon bears W. by S. 1⅓ miles; its position is reported not to be marked by any discolouration of water, and the current in the vicinity has been observed to run at the rate of 4 knots during strong south-easterly winds.

Directions.—Approaching from the northward, the eastern shore may be kept at a distance of about 3 miles from Ras Beilul southward. Give Sanah-bor island a berth of 2 miles, which is midway between it and Bosanquet shoal, and when the island bears about west, steer S. by E. to Buja Road, the anchorage off Asab.

Coming from the eastward, Asab settlement or the light-house bearing S.W. by W. ½ W. leads about 2 miles south-eastward of Fieramosca shoal and about a mile northward of Jezírat Fatma reef and direct to the anchorage. If wishing to proceed to the head of the bay, from a position about one mile westward of Umm-al-Sciora island steer southward through the Mergabela channel, passing eastward of Hodunlai and Umm-al-Baher, two small sandy islands surrounded by a reef, which lie from 3 to 5 miles southward of Ras Luma, and passing westward of Gurda, Darmakia, and Umm-al-Assel islands. The depths through this channel are about 8 fathoms, gradually decreasing to 6 fathoms at the anchorage one mile from the shore off Mergabela.

Anchorage, in from 6 to 7 fathoms, mud, with good shelter from all winds, may be found southward of the islands in Asab bay in a space of 6 miles in extent east and west, by 3 miles in width. There is also good anchorage close to the Italian settlement in 7 fathoms, with the flag-staff bearing N.W.; and from that position southward, in Buja road, in about the same depth.

Tides.—It is high water, full and change, at Ras Makaua at about 0h. 20m.; the rise of tide is about 2½ feet.

ASAB (*Lat. 13° 0′ N., Long. 42° 45′ E.*).—The Italian settlement of Asab is about 1½ miles within Ras Luma on the western side of the northern entrance to Asab bay; territory on the mainland together with most of the islands in the bay

Plan, Asab bay, on chart 8e. Var. 2° 20′ W.

having been acquired by the Italians from the Sultan of Raheita, whose residence is at Mergabela, 7 miles farther up the bay. There are a few European-built houses and a native town of huts, but the colony is small. Vessels should avoid anchoring near the cables shown by a pricked line on the chart.

The mole is about 104 yards long and affords good shelter to native craft loading or discharging, or to boats landing; it is a short distance southward of the light-structure. An obelisk of dark stone, erected at the back of the town, about 130 yards south-westward from the light-structure, is a conspicuous object from the sea.

Supplies.—Communication.—No coals can be obtained, nor fresh provisions in any quantity, nor are there any means for effecting repairs to shipping. A distilling apparatus was at first the only means for the water supply of the colony, but wells sunk about three-quarters of a mile from Ras Buja now give a good and constant supply throughout the year. There is also a small stream, which may sometimes be dry, running into the bay a mile southward of the settlement; at Mergabela also a good and plentiful supply can always be obtained. The water on the islands is brackish and scarce. Firewood is procured on them. Postal communication is maintained by an Italian despatch boat. Asab is also in telegraphic communication by submarine cable with Perim and Massawa.

Islands in the bay.—Jezírat Fatma, on the eastern side of the main and northern entrance to Asab bay, is 5¼ miles eastward from the nearest part of the western shore; it is a low island of horse-shoe shape, 5 miles long, covered with wood, and standing on a reef which has a total length of 7½ miles, north-west and south-east.

Reef.—From the north-western part of the island, this reef extends 8 cables, with from 1½ to 2¾ fathoms; and, from its southern end, it extends 4½ miles east-south-eastward. The extreme width of the reef is 2½ miles, narrowing to 1¼ miles near its south-eastern end, 7 cables within which is the small island of Dercos or Dhi-l-kaus. The south-western side of Jezírat Fatma, and reef form the north-eastern side of the eastern or Rubattino channel into Asab bay.

Haleb island, its south-eastern end, lying 1½ miles south-westward of Ras Sintiyan, extends from thence, including Huiheb islet at its north-western end, 8¼ miles in a north-

Plan, Asab bay, on chart 8e. Var. 2° 20′ W.

westerly direction; its extreme width is 3½ miles. It is very low, partly covered with jungle, and encircled by a reef. Its south-western side is the eastern boundary of Asab bay, and its north-eastern side forms the south-western side of the Rubattino channel.

Ras Makaua.—Beacon.—From Ras Sintiyan, the coast reef takes a northerly direction for 4½ miles, and then, curving in a south-easterly direction for 11 or 12 miles, encloses a shoal space nearly 4 miles wide, on the western and northern sides of which are several small islands. Makaua, the northermost of these, is a low narrow wooded island, its western end only 2½ cables separated from Haleb island. On Ras Makaua, its eastern extreme, is a stone beacon, 37 feet high, painted in black and white horizontal bands, and surmounted by a black spherical cage. The reef extends northward between 2 and 3 cables from the northern side of Makaua island and here forms the southern side of the Rubbattino channel.

RUBATTINO CHANNEL. — Directions. — This entrance, the eastern to Asab bay, between Ras Makaua and Dercos island, inside the Scilla shoals is 7 cables wide between the shoals on either side, and has a least depth of 4 fathoms in the best water in the channel, with from 6 to 9 fathoms elsewhere; but it has central shoals of 1½ and 1¼ fathoms, rendering the passage very intricate and winding.

If Ras Makaua beacon can be seen from the offing 6 miles distant, the Scilla shoals may be avoided by steering for the beacon on a W. by S. bearing until well inside those shoals, or about 2½ miles from the beacon, whence course should be altered to W.N.W. for 2 miles, thence W.S.W. for the entrance. Considering its intricacy and liability to change, as well as the dangerous nature of the shoals off its entrance, previously mentioned, the Rubattino channel should not be attempted by any but those thoroughly acquainted with it.

Chart 3180, Straits of Bab-el-Mandeb, &c.

COAST.—Raheita bluff (*Lat. 12° 44′ N., Long. 43° 6′ E.*), 13 miles south-eastward of Ras Sintiyan, 266 feet high, and 2 miles north-westward of Ras Dumeira, is remarkable from its black appearance and the white sand-drift on its northern slope. About 2 miles north-westward of the bluff and a mile inland is the village of Raheita, consisting of about 70 well-built huts, with a population of about 300. There are also a few straggling villages in the vicinity. Excellent water can be obtained close to the village, and brackish water in the wells. Bullocks and sheep may be purchased.

General charts 143, 8e, and 2523.

Chart 3180, Straits of Bab-el-Mandeb, &c. Var. 2° 10′ W.

Dumeira island, 260 feet high and 2½ miles south-eastward of Raheita bluff, is about three-quarters of a mile long and rises to its greatest height in Jebel Dumeira, a remarkable and sharp double peak in its centre. The island is separated from Ras Dumeira on the mainland by a narrow 5-fathoms channel; there is a small rocky islet outside and nearly joining it, and a small rocky shoal, with a least depth of 2 fathoms, lies about a mile northward of it.

In southerly winds anchorage may be taken up off the western point of Dumeira island, in from 5 to 10 fathoms, sandy bottom.

Ras Dumeira is a rocky bluff presenting at a distance an aspect similar to that of the island, and surmounted like it by two or three summits, one of which is flat. A low sandy plain extends westward from Ras Dumeira up to the mountains of the interior; to the northward there is a sandy shore, and a small harbour where boats can land at all seasons; southward of Ras Dumeira, the shore is bordered by a reef which renders landing difficult.

Boundary.—The Italian and French Protectorate follows the crest of the bluff and is indicated by two boundary landmarks, one erected on the Ras and the other on Dumeira island.

Both Raheita bluff and Dumeira island generally show out well in hazy weather. There are good boat anchorages between Ras Dumeira and the bluff; but there is no good anchorage for vessels in this vicinity during strong southerly winds, except that just mentioned near the western point of Dumeira island.

Aspect.—Jebel Abu-Lulu is a table-land, with a cone, 1,096 feet high, just south-eastward of it, in the near range of hills, about 14 miles westward. In the same direction is Potosi mountain (*Lat. 12° 35′ N., Long. 42° 27′ E.*), a conspicuous double-gapped peak, 5,000 feet high and very steep, a useful mark in navigating the southern part of the Red sea.

Jebel Hadáli, 1,662 feet high, is a remarkable lump on the nearest range of hills, 18 miles westward of Jebel Siyan.

The general appearance of the land between Ras Beilul and Ras Siyan is high, rugged, and mountainous towards the interior, quite barren, and decreasing in several successively lower ranges towards the coast; in the neighbourhood of Ras Sintiyan the hills appear as broken table land; Jebel Abu-Lulu is one of the most conspicuous of these. Farther southward commences a broken mountainous mass of cones having very steep sides and fantastic shapes. Of these the most remark-

Chart 3180, Straits of Bab-el-Mandeb, &c. Var. 2° 10′ W.

able is Jebel Hadáli, just described. Some of the hills have a covering of coarse granular black and lightish-brown earth, intermixed with ironstone.

From Ras Dumeira to Ras Siyan, 18 miles farther south-eastward, the shore is the edge of a low sandy plain extending to the mountains of the interior, whose crest, consisting of a great number of peaks and crenulated summits, lies from 10 to 14 miles inland. Vegetation commences about 1½ miles inland, becoming denser towards the interior and also to the southward. In the vicinity of Ras Siyan is a bushgrowth of considerable extent, to which the natives of Perim and the Arabian coast come for wood.

RAS SIYAN (*Lat. 12° 29′ N., Long. 43° 20′ E.*), the south-western point of the straits of Bab-el-Mandeb, is the eastern extreme of a point rising to a gloomy-looking volcanic peak of reddish colour, 465 feet high, projecting northward from the general coast-line, with which it is connected by a neck of low land 650 yards wide. The northern face of the promontory is rocky and precipitous; on its western side is a swampy bay, surrounded by mangrove bushes, obstructed by coral banks, and affording no anchorage. South-eastward of the point, a bank extends about a mile, with 5 or 6 fathoms at its outer edge.

Rocks.—About 3½ miles north-westward from Ras Siyan, eastern extreme, and from 5 cables to a mile from the nearest shore, are two small rocks, 7 feet high. There are depths of 20 fathoms close to on their eastern side, and an irregular channel between them and the mainland.

Anchorage.—During southerly winds, anchorage may be found just northward of Ras Siyan, in from 8 to 10 fathoms, sand, but the shelter is not good and the tidal streams are strong. There is landing in two small coves on the northern side of the point.

JEZÍRAT SOWABIH, or the BROTHERS (*Lat. 12° 28′ N., Long. 43° 26′ E.*).—This group of six rocky islets extends from near Ras Siyan 7½ miles in an easterly direction; the largest, highest, and north-eastern islet bears E. ½ S. 5½ miles from Ras Siyan, and 9½ miles S. ⅓ W. from the southern and nearest point of Perim island. The western islet is 2½ miles from Ras Siyan, and the eastern islet 6½ miles from the nearest shore, south-westward of it. The channels between them are safe, the depths varying from 6 to 25 fathoms. Between them and Perim is the Large strait.

The islets are of a brownish colour, the westernmost being volcanic. They are of considerable height, and five of the six

General charts 3180, 143, 8e, and 2523.

Chart 3180, Straits of Bab-el-Mandeb, &c. Var. 2° 10′ W.

may be seen in clear weather from 20 to 25 miles distant. The north-eastern islet is 350 feet high, the westernmost 200 feet, and the second from the westward 250 feet. The north-eastern islet has a conspicuous peak, and on its northern side is a bay which forms an excellent boat-harbour protected from all winds except those from between north and east; the bay is abundantly supplied with turtle and various kinds of fish. A low rocky islet to the westward is the only part that may be considered dangerous.

Anchorage may also be taken up southward of the north-eastern isles, opposite a small sandy stretch of shore; also near the western Brother.

The coast.—The description of the African coast southward of Ras Siyan is continued in Chap. IX., page 414.

Plan 2592, Perim island and Bab-el-Mandeb Small strait; also chart 3180, Straits of Bab-el-Mandeb.

STRAITS of BAB-EL-MANDEB.—Between Ras Siyan and Ras Bab-el-Mandab, the straits are 14 miles wide; near the latter is the island of Perim which divides the straits into the two passages known as the Large strait and the Small strait.

The SMALL strait is most commonly used both by steam and sailing vessels; with the former, the chief advantage is the shorter and more direct route; with the latter, the option of anchoring afforded in any part of the strait in the event of the wind falling light.

Directions.—Small strait.—Depths.—Steam-vessels from the northward intending to pass through the Small strait, should avoid the shallowest water westward of Ras Sheikh Syed (page 397) by approaching Perim high light between a S. by E. and S. ½ E. bearing, taking care also to keep within the arc of visibility of Obstruction point light, in order to clear the shoal ground extending from the northern side of Perim and of a wreck charted northward of the shoal ground.

When within 2 miles from the high light, they should bring Obstruction point light on the starboard bow, and, steering about S.E., pass from 4 to 6 cables clear of that point. A vessel should keep rather nearest to the Perim shore in passing through the narrows when coming from the northward, as Oyster islet on the other side is low and difficult to distinguish when no longer seen clear of the higher land behind it.

When approached from the south-eastward, Oyster islet shows out well against the horizon and can be kept in view

Plan 2592, Perim island; and chart 3180, Straits of Bab-el-Mandeb. Var. 2° 10′ W.

until nearly abreast of it. Azalea point, the south eastern extreme of Perim, is foul to a distance of 4½ cables, Azalea rock being that distance off.

Approaching the Small strait from the eastward, a small peak is first seen 25 or 30 miles distant, others gradually rise above the horizon and as approached become united; this is the land about Ras Bab-el-Mandeb. When 15 or 20 miles distant, Perim with its high lighthouse will be seen from the deck, southward of the peak first seen; its outline is even and unbroken, and cannot be mistaken for the high land of Bab-el-Mandeb, which has many irregularities.

For large vessels, the navigable width of the north-eastern or Small strait is rather less than 1¼ miles at its narrowest part, between Obstruction point and Oyster island reef, and has from 8 to 16 fathoms water. As it opens out into the Red sea, the water becomes shallower, and in the fairway at 1¼ miles westward of Ras Sheikh Syed, and about 2 miles northward from Obstruction point lighthouse, are many isolated patches, with only 5 fathoms water extending about 6 cables in the direction of the channel. The fairway for heavy draught vessels is westward of these patches. Southward of the Small strait the water quickly deepens to more than 20 fathoms. For sailing vessels, *see* page 278.

Perim high light, Lat. 12° 39′ 14″ N., Long. 42° 25′ 59″ E.

The LARGE strait, between the southern side of Perim and the Jezirat Sowabih islands to the southward, the narrowest part, is about 9 miles wide, and is a perfectly safe channel, there being deep water right across; in the middle of the strait the depths are from 100 to 175 fathoms. The 100-fathom line passes about 3½ miles of Ras Siyan and 4½ miles off Dumeira island. Within these distances it has not been surveyed. On the Perim side, a bank with a depth of 20 fathoms will be found near the island, except off the mouth of the harbour where patches of 9 fathoms are situated about half a mile off.

Directions.—Large strait.—This passage, though clear of danger, is seldom used by steam-vessels, for the reason just named, but as both extremes of Perim are lighted, a stranger might possibly prefer this passage to the other on a dark night. A sailing vessel using it, with a strong favourable wind, should keep well over on the Perim side, as, in the event of the wind dying away, she may anchor and thus escape being set upon the Brothers, should the current be setting to the southward. If too far off Perim to anchor, the only chance of

Plan 2592, Perim island; and chart 3180, Straits of Bab-el-Mandeb. Var. 2° 10′ W.

bringing up in this channel is near Ras Siyan, or at the north-western islet of the Brothers.

SAILING VESSELS.—During the strong southerly gales which blow in the southern part of the Red sea during the months of December, January, and February, sailing vessels should never attempt to work down to the strait, but should wait for a lull, and then work with the tides, day and night, anchoring close inshore during the flood.

Sailing vessels entering the Small strait from the northward with a fair wind should avoid the foul ground westward of Ras Sheikh Syed, as directed for steam-vessels. If entering from the eastward during north-westerly winds, they should work off and on the Arabian coast, keeping in soundings and anchoring on the ebb if found too strong to work over. At night, the soundings are a good guide; and a vessel working between 15 and 35 fathoms could not miss the Small strait, the edge of the bank off-shore being very precipitous.

In the months of June, July, and August, thick hazy weather is often experienced on the Arabian coast between Aden and the strait. If the wind is north-westerly, fresh gusts may be expected, especially when near the shore, and sometimes the wind changes quite suddenly and blows fresh from the southward. During these months, therefore, it is necessary for a sailing vessel to have good sails bent, and also to observe the caution just given as to keeping within anchorage depths.

On the African shore, the gusts are also violent at times. The only dangers to be avoided are the reefs off Zeila on that side, and those between Ras al Arâ and Ras Kaáu on the Arabian shore; towards these latter, a vessel should not stand into less than 20 fathoms by night or 15 fathoms by day, the water shoaling suddenly. By daylight, the edge of the reef is generally visible.

Chart 3180, Straits of Bab-el-Mandeb, &c.

TIDES.—Perim and in the straits.—It is high water, full and change, at Perim and in the straits generally at 8h.; springs rise $6\frac{1}{2}$ to $7\frac{3}{4}$ feet, neaps $5\frac{1}{2}$ to $6\frac{1}{4}$ feet. The flood sets north-west and the ebb south-east. The streams are very irregular both in period and rate; sometimes in the centre of the strait there is very little ebb, while at other times, at full and change, it runs at a rate of 4 knots, creating a strong ripple when opposed to the wind. In the channels, the tides greatly depend on the prevailing winds; after a fresh north-wester, the flood will run for 16 hours, and *vice versâ* after a south-easter; the water at the same time ebbing and flowing on the beach with great regularity.

General charts 3180, 143, 8c, and 2523.

Chart 3180, Straits of Bab-el-Mandeb, &c.

Currents and tidal streams.—The surface set in the straits of Bab-el-Mandeb is the resultant of the tidal streams and the currents due to wind, and is very variable.

The tidal streams are about $1\frac{1}{2}$ knots at springs; the north-western stream making about 7 hours before superior high water at Aden, and running for 12 hours; for the other 12 hours the tidal stream runs to the south-eastward.

During the period of the strong south-easterly winds, viz., from November to April, the current induced by the wind often overcomes the south-east going stream, and there may be a constant set inwards varying from a quarter of a knot to $3\frac{1}{2}$ knots an hour.

When the stream is running strong into the Red sea there is frequently an eddy to the south-east along the southern shore of Perim island.

No observations have yet been obtained during the period of north-westerly winds.

From June to September, while the south-west monsoon is blowing in the Indian ocean, the general result of the surface set is out of the Red sea, but during the north-east monsoon, from November to April, into the Red sea. In the straits of Bab-el-Mandeb the current has reached a total amount of 40 miles a day. In November 1901 H.M.S. *Fox*, passing out of the Red sea through the Large strait, experienced a set of about 3 knots.

From observations made by H.M. surveying vessel *Stork*, in January 1898, whilst at anchor, in 118 fathoms, 7 miles S.W. by W. from Perim island, it would appear that the resultant of the surface current was at that season into the Red sea, at an average rate of $1\frac{1}{2}$ knots; but that although the current was generally setting in, its rate was greatly accelerated, or retarded, by tidal influences. From about 8 hours before to 4 hours after the highest high water at Perim, the rate of the current inwards was from $1\frac{1}{2}$ knots to $2\frac{1}{2}$ knots; whilst from 4 hours after to 8 hours before the highest high water the rate of the inward current was from 0 to $1\frac{1}{4}$ knots.

Under-currents.—From observations made for a period of four days, January 19th to 23rd, 1898, by H.M.S. *Stork*, with a view of ascertaining the difference in the set of the lower strata of the water at the entrance of the Straits of Bab-el-Mandeb, with reference to that of the upper portion; the following broad results were arrived at:—

There was a permanent current on the surface setting into the Red sea of about $1\frac{1}{2}$ knots per hour.

There was, at 105 fathoms depth, a permanent current setting outwards of probably the same velocity.

General charts 3180, 143, 8e, and 2523.

Chart 3180, Straits of Bab-el-Mandeb.

The tidal stream was about $1\frac{1}{4}$ knots at its maximum and flowed for about 12 hours each way, as might be expected from the fact that in this locality there is practically only one tide in the day.

This tidal stream prevails to the bottom with variations of strength. Somewhere about 75 fathoms is the dividing line between the two permanent currents, but it would require a longer series of observations to determine this point with any precision. Both are influenced by tide.

Plan 2592, Perim island.

PERIM ISLAND, situated in the Straits of Bab-el-Mandeb, is a British possession.

Perim, for many years a place of little or no value, and its only inhabitants a small detachment of Indian troops, has now become of great importance from its excellent position as the coaling station of the Perim Coal Company, by whom the harbour is lighted and buoyed, as well as its being a station of the Eastern Telegraph Company and for Lloyd's signals. The population in 1901 amounted to 1,236. No one is allowed to reside on the island without the permission of the Resident.

It has a good harbour and convenient coaling station on its south-western side.

The island is bare and rocky, rather flat in appearance, about $3\frac{1}{3}$ miles long and $1\frac{3}{4}$ miles wide; its highest point near the south-eastern end, on which is Lloyd's signal station, being 214 feet high. The lighthouse is on the same ridge, northward of it. Near the western end is Signal hill, 112 feet high, on which is another signal station.

The surface of the island is grooved with watercourses, and covered with coarse grass and stunted shrubs, the subsoil being sand and conglomerate coral.

Shoals.—Shoal water, of 16 feet and less, extends half a mile seaward from Ras Sheikh Berkhud, on the northern side of the island, with 4 fathoms on its outer edge; and at $1\frac{1}{2}$ cables off Azalea point the south-eastern point of the island, is a rock having 2 fathoms least water, with 4 and 5 fathoms close to; from the rock Perim high lighthouse bears N.W. $\frac{3}{4}$ N.

On the western side a reef about one cable off a small point half a mile south of Balfe point. No other dangers outlie the points.

Telegraph cables.—Perim is in telegraphic communication by cable with Aden, Suez, Obokh, Asab, Massawa, and Suákin; the rates are the same as at Aden.

LIGHTS.—High light.—On the eastern and highest part of Perim, half a mile south-westward of Obstruction point, within an embattled wall, stands the high lighthouse, of grey

2592, Perim island. Var. 2° 10′ W.

stone, 38 feet high, with a white lantern, exhibiting, at 249 feet above high water, a *revolving white* light with a period of *one minute*, visible 22 miles. The eclipses are not total within 15 miles.

Obstruction point.—At 30 feet from the edge of the cliff on Obstruction point, from an octagonal grey lighthouse, 30 feet high from base to vane, and at 85 feet above high water, is exhibited a *group occulting white* light with a *ten-seconds* period, thus :—light, *seven* seconds ; eclipse, *one* second ; light, *one* second ; eclipse, *one* second. The light is visible at a distance of 14 miles from S. 27° E. through south, to N. 43° W.

Balfe point.—On this point, the western extreme of Perim island, is a conical white lighthouse, 31 feet high, from which is exhibited, at 46 feet above high water, a *fixed white* light, visible 10 miles from N. 15° W. through north and east to S. 14° W. The light is screened and obscured through the remainder of the circle.

Signal Station.—A signal station with which vessel can communicate is situated on Signal hill.

Vessels wishing to communicate at night must pass through the large strait, when they can communicate with the lower signal station on the south-western side of the island. The position of the station is marked by two *red* lights.

Plan on sheet 923, Perim harbour.

PERIM HARBOUR is divided into two branches by Murray point, on which are two white beacons which serve as leading marks into the harbour by day, and on which the leading lights are exhibited by night. The main branch extends one mile to the north-westward ; the other about 7 cables in a north-easterly direction, and is much encumbered with shoals. The bights on the eastern shore are Shand bay, James bay, and William bay.

Entrance.—Depths.—The entrance between Pirie point on the north-west and Lee point on the south-east is $4\frac{3}{4}$ cables wide, and has from 7 to 9 fathoms water, and from 8 to 9 fathoms in the fairway for a berth of 2 cables, extending to within a cable of either side. The north-western arm has the more available space and forms the port; the depth gradually decreases to 3 fathoms at half a mile within the entrance points, and thence becomes shallower as the head is approached. Anchorage may be obtained in it in 5 or 6 fathoms, sand and coral bottom, with plenty of room for a ship to swing at about 2 cables from the coral stores.

Myrmidon shoal rather interferes with the anchorage of vessels of deep draught in Perim harbour. It has a least depth

Plan on sheet 923, Perim harbour. Var. 2° 10′ W.

of 27 feet at low water springs, with sandy bottom. It is 150 yards long, north-west and south-east, and less than 50 yards wide; from its north-western extreme, taking 5 fathoms as the limit, Pirie point lighthouse bears South $2\frac{2}{10}$ cables, and the eastern coaling pier-head W. ½ N.

Harbour lights.—In addition to the principal lights of Perim island, already described, the following lights are exhibited for the guidance of vessels entering the harbour:—

Murray point.—Two *fixed white* lights on the beacons on this point, visible at a distance of 3 miles. They are respectively 34 and 44 feet above high water, and 100 yards apart; when in line bearing N. 13° W. they lead into the harbour.

Pirie point.—From an iron staff on a white hexagonal house, at 44 feet above high water, is exhibited a *fixed red* light, visible 3 miles.

A small *fixed white* light is also shown from the club pier, less than half a cable westward of the westernmost coaling pier.

Gas buoys.—One off Pirie point, west side of the entrance; another, S. 64° E., 3½ cables from it, and just within Lee point, east side of the fairway; both show *fixed white* lights, and are painted white. A *fixed red* light is also shown from a red buoy moored about 40 yards south-westward of No. 2 mooring buoy, as a guide for vessels making for a mooring buoy by nights.

Buoys.—In addition to the two gas buoys at the entrance of the harbour, already described, four can buoys, also painted white, are placed to mark shoals on the northern shore of the harbour, and must all be left on the starboard hand when entering, viz.:—On the southern side of the Nimble shoal of 2¼ fathoms; on the south-western side of a shoal of 2 fathoms lying about 2 cables westward of Nimble shoal; on the south-western side of 2¾-fathoms extension of the shore reef, which projects one cable south-westward from Murray point; and at three-quarters of a cable S. by W. from Nevis point.

Moorings.—Four red mooring buoys are placed on the southern side of the harbour, off the pier; also several smaller mooring buoys for coal lighters in shallow water closer inshore. A large red buoy, with a yellow flag, in 2½ fathoms near No. 1 mooring buoy and about 70 yards northward from the old Observation spot, marks the dhows' quarantine anchorage.

Two buoys in Shand bay are for the use of pilgrim ships.

Cairns.—There are two cairn beacons on Lee point; the rear beacon bears N. 62° E. 260 yards from the front beacon.

General charts 3180. 143. 8e. and 2523.

Plan, sheet 923, Perim harbour.

Flag-staff.—A flag-staff has also been placed on the cairn just eastward of the assistant Resident's house and about 2½ cables north-westward from Murray point; this latter is a useful mark in entering the port.

Pilots.—By hoisting the usual pilot flag by day, or burning a blue light at night, as soon as Perim high light is well in sight, the attendance of a pilot, well outside the harbour, is assured; corresponding signals, in answer, are made from the shore.

Tides, *see* page 278.

Directions.—To enter Perim harbour, caution is necessary as the current occasionally sets across the entrance according to the direction of the wind. Bring the lights or beacons on Murray point in line N. 13° W. and steer for them, passing between the light-buoys off Pirie and Lee points; check the ship's way as she passes Pirie point, haul round into the North-west arm, with the flag-staff at the signal station in that arm bearing W.N.W., and anchor as convenient; or proceed to one of the mooring buoys as may be desired or as the harbour-master may direct.

A deep-draught vessel may give the 4½-fathoms shoal extending from Pirie point a wider berth by entering with the flag-staff on the cairn just eastward of the Assistant Resident's house in line with either of the leading beacons.

Coal and supplies.—Welsh coal can be obtained from the stores of the Perim Coal Company and put on board at from 50 to a maximum rate of 120 tons an hour. A stock varying from 5,000 to 15,000 tons, according to season, is kept in store, and from 800 to 1,000 tons is always afloat in lighters ready for delivery in bulk by night or day. The Company has 18 steel lighters of from 90 to 120 tons each; there is room for 14 lighters at one time alongside the Company's three piers, and there is no liability to interruption of coaling from bad weather.

Provisions, stores, ice, and water may be procured; if fresh provisions in large quantity are required, a vessel should give notice to the Perim Coal Company by telegraphing "en clair," the telegraphic address of that Company being "Perim Perim." The storage of ice is about 25 tons, and the ice plant produces about 5 tons daily; it is supplied at 5*l*. per ton.

Water is obtained by means of condensers, close to which is the Water pier, with 12 feet water alongside its head, at low water springs; it has pipe delivery both at head and sides;

Plan on sheet 923, Perim harbour. Var. 2′ 10° W.

and on it is a derrick to lift 7 tons. Water is sent alongside in steam or motor tanks and pumped into vessels at from 20 to 60 tons an hour; the price is about 10*s.* per ton, but there are special prices for large quantities.

Repairs, &c.—The services of an extensive salvage plant, and of European divers, can be had at this place, and considerable repairs to ship and machinery can be effected. There are two small slipways with winches for lighters and launches, which can haul up 100 tons dead weight. Several small steam cranes, steam hammers, punching machines, blacksmith's shop, &c., are also available.

Shipping.—In 1906–7, 414 vessels entered Perim.

Winds and weather, &c.—*See Meteorological tables,* page 557.

General charts 3180, 143, 8c, and 2523.

CHAPTER VI.

EAST COAST OF RED SEA FROM RAS MUHAMMED TO JIDDA, INCLUDING THE GULF OF AKABA.

(Lat. 29° 30′ N., Long. 34° 15′ E., to Lat. 21° 30′ N., Long. 39° 15′ E.)

VARIATION IN 1909.—Decreasing 4′ annually.

Chart 8a, Red sea, sheet 1. Var. 2° 30′ W.

GENERAL REMARKS.—Having, in the preceding chapters, completed the description of the western shores of the Red sea and Straits of Bab-el-Mandeb, we now return to the northern end of the Red sea, and, starting from Ras Muhammed (*Lat. 27° 43′ N., Long. 34° 15′ E.*), proceed to describe the eastern shore of that sea, the scope of the present chapter including both the gulf of Akaba and the port of Jidda.

The eastern shore of the Red sea is Arabian, but forms a part of the Turkish empire, and is divided, at about the parallel of 20° N., into the two provinces of Hedjaz and Yemen, the former being the northern, the latter the southern, province. The part now to be described, therefore, embraces almost the whole littoral of the province of Hedjaz, which province includes within it the sacred cities of Medina and Mecca, the former the burial place of Muhammed, the latter his birthplace.

Aspect.—From the Gulf of Akaba to the Straits of Bab-el-Mandeb, a distance of 1,000 miles, the Arabian mountains are conspicuous throughout, presenting peaked summits of naked rock from 5,000 to 8,000 feet in height, and varying from 12 to 60 miles in distance inland. This range falls so abruptly on its western face that it presents towards the sea a series of inaccessible cliffs; other, but lower, ranges approach the sea shore in some places, decreasing in height as they approach. In clear weather these mountains are visible at from 40 to 70 miles, the most remarkable are Mount Mowila, the Rudhwa mountains, and Jebel Subh; the others present but little variety.

The higher mountains exhibit formations of gneiss and porphyry in vertical strata, rising above hills of sandstone and

Chart 8a, Red sea, sheet 1. Var. 2° 30′ W.

gypseous rock. Many of the hills nearer the shore are of limestone, consisting almost entirely of a mass of marine fossil remains; those bounding the sea shore are of light coloured sandstone, fronted by and containing large quantities of shells and masses of coral. The extraordinary prevalence of the latter in the Red sea, as was remarked in the first chapter, *see* page 2, is well known; indeed, its coral reefs are probably as extensive as those found in any part of the world; it also enters largely into the composition of some of the heighest hills.

From the bases of these hills to the shore of the tract between Ras Muhammed and Jidda, there lies a border of lowland of irregular width, which the Arabs call Tehama. It is generally desert and barren; some few spots are cultivated, but they bear so trifling a proportion to the whole as to scarcely need notice.

Inner channel.—Small craft anchorages.—The coast-line northward of Yenbo (*Lat. 24° 6′ N., Long. 38° 3′ E.*) is of moderate height, varying from 50 to 100 feet, with no beach. Southward of that port it is more sandy and lower; the inlets and harbours of the former tract are little more than coves; in the latter lagoons.

Farther southward, from Yenbo to Jidda, the coast, consisting of sandbanks with coral bases, is lined with reefs, lying nearly parallel with the shore, with which they are in many places connected. It is very difficult, if not impossible, to distinguish the entrances to inlets or sherms in this district without the aid of a native pilot. To the natives, they compensate in some degree for the deficiency of better anchorages, and they are so situated with respect to each other as to form convenient halting places for boats and trading vessels in their progress up and down the Red sea. In some places there are none, and the Arabs are, under these circumstances, constrained to depend on the precarious shelter afforded by reefs.

There is no probability of their being frequented by steam-vessels to any appreciable extent in the absence of ports of trade.

Winds and weather in the Inner channel.—At page 138 is given a short outline of the winds usually experienced in the Inner channel on the western side of the Red sea. They are very similar on the Arabian side; but the Indian surveying vessels remarked in 1830–1834 that although they experienced land and sea breezes on the Arabian shore more frequently in March and April than on the African side, the land squalls in the southern part of the sea occurred in April and May. From May to July, when they experienced

Chart 8a, Red sea, sheet 1. Var. 2° 30′ W.

them on the Nubian coast, there was thick hazy weather and heavy dews on the Arabian side opposite. *See also* remarks on winds, weather, rainfall, &c., in Chap. I., and at the end of the present chapter.

The reefs in this part of the Sea either extend in ridges, generally with deep water near them, or they form extensive banks, with from 10 to 15 fathoms over them. With some few exceptions, their general direction is fairly straight though in many places the short projections on either side give them a serpentine appearance. Their length varies from 150 yards to 2 or 3 miles, which they rarely exceed; and it is important to remark that under no condition of wind or weather is a heavy surf to be seen on most of them; this is probably owing to the coral being more porous on the outer parts of the reefs, and also to its being of the branched variety, by which the force of the sea becomes much reduced.

Charts 757, Gulf of Suez, and 8a, Red sea, sheet 1.

COAST.—Aspect.—Ras Muhammed has been fully described at page 120. The land leading to the point from the high land of the peninsula of Sinai which separates the gulfs of Suez and Akaba, is a long narrow tract nearly divided from the peninsula about 5 miles from the point, by the deep bay of Ghazuláni on the eastern side. Immediately northward of this, a range of mountains takes its rise and extends nearly the whole length of the peninsula; the general height of these mountains is from 3,000 to 5,000 feet, and during the winter months the summits of the highest are frequently covered with snow.

From the narrow neck described, near Ras Muhammed, to the entrance of the gulf of Akaba, the coast is high and precipitous, having no soundings near the shore.

Plan on sheet 3047, Sherm Sheikh, &c.

Sherm Sheikh and Sherm el Moiya (*Obs. spot, Lat. 27° 51′ 5″ N., Long. 34° 16′ 50″ E.*).—About 8 miles northward from Ras Muhammed are the two small harbours Sherm Sheikh and Sherm el Moiya, separated from each other by a rocky tongue of land, from 50 to 70 feet in height. The western harbour, Sherm Sheikh, derives its name from the tomb of a sheikh at its eastern extreme; it is more capacious and has a wider entrance than the other. It affords good anchorage abreast of the tomb, about 1½ cables from the shore, in about 14 fathoms, sand, but care must be exercised in taking up a berth as the bank drops abruptly into deep water.

General charts 757, 8a, and 2523.

Plan on sheet 3017, Sherm Sheikh, &c. Var. 2° 30′ W.

The entrance to the completely sheltered harbour of Sherm el Moiya is 1½ cables wide, but so obstructed by coral banks, that a vessel drawing more than 10 feet can only make its way between these obstacles with great caution, and there is no anchorage outside them. It has a depth of about 6 fathoms within the outer reef, shoaling towards its head.

There are wells in Sherm el Moiya containing but little water, and that brackish; they are on the western side of the bay, about 150 yards from the shore.

From this place, Mount Sinai may be reached, in 2½ days, by a comparatively good road.

Between Ras Muhammed and these harbours there is no anchorage on the coast; the mountains are close to the sea and present a grand range, from 3,000 to 5,000 feet high, extending both north-eastward and north-westward.

Chart 8a, Red sea, sheet 1.

GULF of AKABA (*Entrance, Lat. 27° 57′ N., Long. 34° 27′ E.*).—This gulf has a general north-north-easterly direction for about 98 miles, the width varying from 7 to 14 miles; the shores are closely bounded by mountainous ridges, mostly of granite, which continue to preserve the same direction far beyond the head of the gulf, terminating on the borders of the Dead sea; in many places they rise from the plain like a wall, and the passes over them are extremely difficult. Where only sandy points occur on the shores of the gulf, they are all caused by torrents at times washing the sand out of the larger valleys.

The mountainous district on the eastern side of the Gulf of Akaba is inhabited by the Omran and Howatat tribes.

During the greater part of the year, north-north-easterly winds blow with considerable force at times down the Gulf of Akaba, but in April and May they are generally more moderate, and an occasional change to a southerly wind occurs in that period, which makes it the most favourable time for an ascent of the gulf by a sailing-vessel. Southerly winds sometimes occur in the winter months; they come on suddenly and blow for some hours or even for a day at a time.

H.M.S. *Gannet*, visiting the gulf for a week at the end of August 1894, found northerly winds of light to moderate force.

The depths in the gulf of Akaba are greater than those in the gulf of Suez, no bottom being found at 130 fathoms in the former; the shores are steep-to. The bottom of the gulf of Akaba is a continuation of the valley in which lie the Dead sea and river Jordan, both of which are much below the level of the Mediterranean.

General charts 757, and 2523.

Chart 8a, Red sea, sheet 1. Var. 2° 30′ W.

Strait of Tirán (*Lat. 27° 57′ N., Long. 34° 27′ E.*).—The entrance of the gulf of Akaba is nearly closed by the island of Tirán with its extensive reefs. The Strait of Tirán is the passage on the western side of that island; it is 4 miles wide, and there are depths of 70 fathoms within a mile of Ras Nuzeráni on the western side of the entrance. Reefs project westward from Tirán island towards the coast reef extending 5 cables from Ras Nuzearáni, leaving a channel only about 2 cables wide between the edges of these dangers through the straits. Through this channel the wind and swell come down with great force at times. There is also a passage into the gulf north-eastward of Tirán, about a quarter of a mile wide in the narrowest part between the reefs bordering it. This is the best and safest channel for a sailing vessel, as the prevailing wind would be nearly abeam and there is anchorage throughout as far as Ras Fartak, the eastern mainland point of entrance to the gulf.

For Tirán island and anchorage, *see* page 292.

ANCHORAGES.—For the convenience of those navigating the gulf of Akaba, the descriptions of the anchorages affording shelter in case of need are now given in the order in which they come on either hand as a vessel proceeds northward.

Ras Fartak (*Lat. 28° 6′ N., Long. 35° 35′ E.*).—Southward of Ras Fartak there is good anchorage, where a vessel may remain until the wind allows her to proceed up the gulf, which at this point is 6½ miles wide; above this it widens considerably. The first anchorage above Ras Fartak is on the eastern shore, in Sherm Mujawan, a snug cove with a narrow entrance, between 6 and 7 miles north-eastward from Ras Fartak; southward of the land-spit in the middle of the harbour the depth is 2½ fathoms.

About 5 miles farther, good anchorage will be found in Sherm Dhaba. From this, there is no anchorage on the eastern side until Bir-al-Mashiya, nearly 40 miles farther northward and presently described.

Plan on sheet 3047, Mersa Dahab.

Mersa Dahab (*Lat. 28° 28′ N., Long. 34° 30′ E.*), or the Golden Port, probably the Eziongeber of the Bible, is on the western side of the gulf, about 32 miles northward from the peak of Tirán island. This port is formed by a sandy point projecting nearly 2 miles, eastward from the line of coast and then turning southward and westward; on the outer extreme of the point is a large date grove; among the trees, indifferent water may be found in some wells. The date grove is inhabited during the fruit season, but the Turwari Arabs return,

Chart 8a, Red sea, sheet 1. Var. 2° 30′ W.

before the winter months, for pasture to the valleys between the lofty and rugged mountains in the Sinai peninsula.

Dahab, about 2 cables wide, is a perfectly sheltered little anchorage, with good holding-ground in about 12 fathoms, with the extreme of the spit W.S.W. about three-quarters of a cable. The inlet is about 7 cables in length but dries at about 2 cables within the extreme of the spit. Also, outside, westward of the spit, is good anchorage, in about 8 fathoms, but the ground in the vicinity is rocky and uneven. A reef, covered at high water, projects 3¼ cables in a south-south-westerly direction from the south-eastern corner of the land-spit.

Ras Arser.—The next anchorage is on the same side about 10 miles northward of Dahab, under the lee of the sandy point Ras Arser.

Wasit, where good anchorage may be obtained during northerly winds, is a low sandy point 13 miles northward of Ras Arser.

Bir-al-Mashiya (*Lat. 28° 51′ N., Long. 34° 51′ E.*) is a temporary anchorage on the eastern side of the gulf, about 10 miles eastward from Wasit. The anchorage is under a sandy point, in 5 or 6 fathoms, well protected from northerly winds; the depth increases very rapidly to seaward. A small patch of rocks surrounds this point and extends a little to seaward, but there is deep water a mile from the shore. A bank with rocks nearer the shore, extends from one to 2 miles off the shore for 6 miles northward of the sandy point.

Nawibi, another low sandy point, on the western side, with a large grove of date trees on it, is 7 miles northward of Wasit, and about 10 miles north-westward of Bir-al-Mashiya. This spot affords good shelter from northerly winds, in 7½ fathoms; coral and sand; indifferent water may be obtained among the date trees, where there are some wells. Several coral banks, with less than 2 feet water lie in the western part of the roadstead, with 5 fathoms close-to; the anchorage is otherwise clear. There is a frontier fort about 3 miles northward of the anchorage at Nawibi, with a small Egyptian garrison, which can be seen 5 miles distant; a palm grove fringes the shore to the southward.

Abu Ramlah, the northern point of a small bay, about 12 miles above Nawibi, on the same side, is the next anchorage, and is sheltered from northerly winds. It is in lat. 29° 8′ N., and its position may be known by that of White cape, a white patch or sand-drift on the lower hills, 2½ miles north-north-east from the point.

General chart 2523.

Chart 8a, Red sea, sheet 1. Var. 2° 30′ W.

Between White cape and Jezírat Faraun, near the head of the gulf, there are three more anchorages in small bays on the western side, affording shelter from north-easterly winds; the first is 2 miles northward of White cape; the next, 7½ miles from White cape; the third, about 11½ miles.

Omeider.—The distance from White cape to the opposite shore, where there is a small bay with Omeider island in the centre, is 9 miles. There is good anchorage between that island and the mainland, but like all other anchorages except Dahab and Mujawar cove, it is exposed to southerly winds, which sometimes, in the winter months, come on suddenly and blow hard for a few hours or even for a day.

Tides.—At Omeider, it is high water, full and change, at 6h.; the rise is 4 feet.

Plan on sheet 3595, Jezírat Faraun.

Jezírat Faraun (*Lat. 29° 25′ N., Long. 34° 53′ E.*) is about 2 cables long, north and south, and less than one cable wide. Jezírat Faraun is a barren rock, on which are several towers and ruins, the latter consisting chiefly of an old Saracenic castle, in which are the remains of capacious water tanks; its southern end is about 2 cables from the mainland, the northern end not more than 1¼ cables. Between the mainland and the island there is good anchorage in from 7 to 9 fathoms, sand and rocks. The width available for anchorage is nowhere more than about 150 yards, as shallow water extends some distance off from both island and mainland shores. The Arabs at Akaba will sometimes bring supplies to this place in five or six hours.

Plan of Akaba on sheet 3047.

Akaba is a small Arab village, in an extensive date grove on the eastern shore, nearly at the head of the gulf. Close to the village is a small square fort, garrisoned by Turkish soldiers. This is a depôt for grain for the use of caravans on their way to and from Mecca, and a small supply of provisions may be obtained here. The fort, according to the observations of the Austrian man-of-war *Pola*, is in lat. 29° 31′ 15″ N., long. 34° 59′ 20″ E.; this is 3 miles N. 40° W. from the position assigned it on chart 8*a*. Near the fort and in the adjacent country are numerous ruins.

Anchorage may be had off Akaba, in 11 fathoms, with the fort bearing E.N.E. 2 cables; in southerly winds, in order to obtain more shelter from the heavy sea, it is advisable to be farther south, as near as convenient to the point.

General chart 2523.

Chart 8a, Red sea, sheet 1. Var. 2° 30′ W.

From the fort of Akaba, the head of this gulf forms a circular bay, 3 miles to the northward and north-westward, and the same distance across, but abreast of Jezírat Faraun, it is about 6 miles wide. At the head, the shore is very low being the end of Wadi-el-Araba, a sandy valley, bounded on each side by high mountains.

Anchorage.—At the head of the gulf, there is good anchorage, with protection from northerly winds; in anchoring at this place, it must be recollected that southerly winds which occur at times bring up a heavy swell.

Water.—Water may always be obtained at the head of the gulf by digging a few feet deep, close to the beach.

Chart 8a, Red Sea sheet.

TIRÁN ISLAND (*Lat. 27° 55′ N., Long. 34° 31′ E.*), in the east side of the entrance to the gulf of Akaba, is about 7 miles long by 5 miles wide. On its southern part, near the centre, is a peak 1,670 feet high, a useful mark for fixing position in entering or leaving the Gulf of Suez; the remaining part is a low sandy plain, the northern part nearly separated from the southern part by a long inlet on the north-eastern side. The south-eastern part of the island is surrounded by a reef, but close off the southern and western sides there is no bottom at 60 fathoms; the western side is 4 miles distant from the peninsula of Sinai, but, as already stated at page 289, the navigable channel into the Gulf of Akaba is only about 2 cables wide between the edges of the reefs extending from Tirán, and from the mainland coast.

There is no water on Tirán except that left in holes of the rocks after rain, and it produces nothing but colocynth plants and saline shrubs.

Tirán Island, *N. 50° E. about 25 miles.*

Anchorage.—There is anchorage sheltered from all sea on the north-eastern side of the island, with the peak bearing S.W. by W. ½ W.; it is approached by a channel 4 cables wide between the reefs round the eastern end of the island and the shoal in the centre of the passage between it and Senafir island; the bottom is everywhere rocky and foul.

General chart 2523.

Plan of Akaba on sheet 3047. Var. 2° 30′ W.

Senafir, 2 miles eastward of Tirán, is 4 miles in length, of semicircular form, with a bay on its southern side, where there is excellent anchorage in 7 or 8 fathoms, sandy bottom, but it is open to southerly winds. At the mouth of this bay is a 5-fathoms bank, and in the fairway north-eastward from its west entrance point is a rock with less than 2 fathoms over it. Depths of 15 and 25 fathoms extend some distance southward of the island. Numerous broken peaked limestone hills cover the eastern part of the island, the highest is near its south-eastern end.

COAST.—From the south-eastern point of entrance to the Gulf of Akaba to the harbour of Eynunah, the coast is low and sandy, deeply indented, and fronted by coral reefs, having narrow and intricate channels between them, barely navigable for boats. Between Eynunah and Mowila the patches of reefs are wider apart, and for a considerable extent, deep water extends to within a short distance of the shore. In this part, the coast is backed by lofty mountains, attaining a height at Mowila peak of 9,000 feet. The mountains in this locality are nearer the sea than in other parts, and the land between affords plenty of fire-wood and grazing for sheep.

Eynunah harbour (*Lat. 28° 2′ N., Long. 35′ 13° E.*).—This harbour, although its approach is much encumbered with reefs, may, with the assistance of a good pilot, be entered with facility and safety. One may probably be obtained at Barakan island.

Towards the interior, at 1½ miles from the beach, between two barren and rocky hills, is the valley of Eynunah, celebrated among the Bedouins for the purity and abundance of its water. About 2 miles from the beach, a long line of cliffs rises from the plain and forms the outer edge of an extensive tract of table-land. The appearance of the luxuriant, though uncultivated tract contrasts strangely with the wild sterility of the neighbouring scenery. On both sides of the valley are ruins, and, from it, leading to the beach may be seen the remains of an aqueduct by which water was formerly conveyed to a reservoir near the beach. Jebel Eynunah, 6,090 feet high, bears N. ¾ E. 15 miles from the anchorage.

Shushuah island lies 8 miles eastward of Senafir, and is about 2 miles long, north and south, by one mile wide; from its low northern point it gradually increases in height to a bluff, 200 feet high, at the southern extreme. On some bearings, therefore, the island appears wedge-shaped. The whole island appears to be formed of variegated red and yellow sandstone, mixed with coral. Large masses of the latter, of the madrepore

Chart 8a, Red Sea, sheet 1. Var. 2° 30′ W.

or branched form, so often met with on reefs near the surface, may, when the rain has washed away the soil, be seen embedded in the rocks; and loose broken pieces of the branched kind, besides petrified shells and other marine remains, are thickly strewed over the surface.

The southern side of Shushuah is steep-to, there being no bottom at 50 fathoms; but, on the eastern side, a small reef projects, and beyond it a bank extends a short distance, on which is anchorage, in 7 or 8 fathoms, sand and rock.

Barakan island (*Lat. 27° 54′ N., Long. 35° 4′ E.*) lies 7 miles further eastward than Shushuad, and is divided into two parts connected by a low sandy tract, so that from a distance its two wedge-shaped hills appear as two separate islets. It is about 2½ miles long and 100 feet high. On a near approach its broken and rugged appearance is very remarkable, large masses detached from the body of the hills lying scattered at their bases. Off its north-western end and eastern side are some patches of sunken rocks; the western and southern sides are safe to approach within a moderate distance, but it is fringed with reef.

Anchorage.—Good anchorage, with sandy bottom, may be found close to the south-eastern end of the island, well sheltered from north-westerly winds. There is also anchorage, in from 7 to 15 fathoms, eastward of the isthmus connecting the two parts of the island; a good berth should be given to the southern part of the island in rounding it for this anchorage, which should not be steered for until the isthmus bears about W. by N. A good look-out from aloft should be kept for coral reefs, as there are many awash in these parts, not shown on the charts. If required, a pilot for Eynunah can generally be obtained at this anchorage.

YUBA ISLAND (*Lat. 27° 46′ N., Long. 35° 8′ E.*), is 2 miles long north-west and south-east, its northern end being a precipitous cliff, 350 feet high, sloping gradually to the south-eastern end. The south-western side is fringed by reef on which are two or three rocky islets, but there are neither soundings nor anchorage near this island. Wyler and Jelaijli islands, two low small coral islands, lie 2 or 3 miles eastward of Yuba, and there is also a small reef one mile south-eastward from the southern end of Yuba, and another, Shab Pelham, 2½ miles north-north-west from the northern end, having no soundings near them.

Yuba island lies about west 12 miles from Ras Wadi Turian on the mainland, and between it and the shore are many reefs with deep water between them; this is also the general

Chart 8a, Red Sea, sheet 1. Var. 2° 30′ W.

character of the bight lying inside the island just described from Tirán south-eastward.

Sila islands are a group of low coral islets which, with the reefs on which they stand, are 7 miles long north-west and south-east, the southern end being about 12 miles south-eastward of Yuba.

Between this group and the reefs extending off Mowila, is a narrow channel, but the Sila island reefs extend fully 2 miles eastward and south-eastward of those islets, and, with light winds, no sailing vessels should use it, as there is no anchorage near the Sila islands nor near the reef just mentioned.

MOWILA (*Lat. 27° 40′ N., Long. 35° 29′ E.*).—The village and fortress of Mowila is also a depôt for grain for Moslem pilgrims. A small Turkish garrison protects the place. The coast in the vicinity is low but gradually rising to hills of great height in the background.

Reefs.—From Mowila, a reef extends 9 miles westward and at its broadest part is 3 miles wide. In a south-westerly direction from Mowila is a bank of 10 fathoms, and between this and the reef mentioned is a deep channel. Another bank, having on it numerous rocky and shallow patches, lies in a south-south-west direction from Mowila. It is 10 miles long and lies approximately parallel with the shore, from which its least distance is 2½ miles.

Between the last-named reef and the shore is a deep channel, but it is not recommended for a sailing vessel as the reefs have no soundings near the shore. With light winds, a vessel might anchor among the shoal patches on this reef, and temporary anchorage has sometimes been found on the reef, 2 miles westward of Mowila.

Supplies.—From Mowila, excellent sheep and water may be obtained, but the anchorage is unfit for either ship or boat, in addition to which the approaches are dangerous. Should a vessel require water or other supplies, besides getting good shelter, she should run into Sherm Yahar, presently described, 4 miles south-south-east from Mowila. There is a caravan route from Mowila to Medina through Tebuk.

Inhabitants.—The country in this vicinity from Akaba to Nomán island is under the control of three powerful tribes, the Howatat, the Omran, and the Uleggat, who formerly had, and perhaps still have, a bad reputation. The country bordering on the sea coast affords excellent pasture. Between Eynunah and Mowila, Bedouins' huts are numerous, and large flocks of sheep and goats are met with. Their residence, however, is

Chart 8a, Red Sea, sheet 1. Var. 2° 30′ W.

merely temporary; for, should the rain fail them—an event that occurs about once in four years—they retreat from the low countries to their mountains. In this lofty range, of which many mountains are about 6,000 feet in height, they possess abundance of water and a never-failing supply of herbage.

Mowila peak (*Lat. 27° 36′ N., Long. 35° 45′ E.*).—This remarkable mountain lies 14 miles eastward from Mowila, and is a conspicuous object from the sea. The land from the shore near Mowila rises gradually during 6 or 7 miles, when it ascends abruptly to mountains of great height, terminating in the sharp and singular peaks known as mount Mowila. These are in reality very sharp ridges which on some bearings show as peaks, especially from the southward, when they have an irregular columnar appearance with chasms rather than valleys between them. When viewed from the northward most of these peaks overlap each other, and mount Mowila then appears as a narrow ridge. It is at the south-eastern extreme of an immense range of high mountains, and its highest point charted as 9,000 feet high.

Plan of Sherm Yahar, on chart 8a, Red sea, sheet 1.

SHERM YAHAR is an inlet about 4 miles southward of Mowila receding nearly 6 cables in a north-easterly direction; the entrance is only half a cable wide, with about 12 fathoms in mid-channel; inside, the anchoring space in some places is three-quarters of a cable wide, with depths of from 6 to 8 fathoms, well sheltered from the prevailing winds, being open to the south-west. On the northern side of the entrance is a pile of stones raised by the Arabs, without which it would be difficult to distinguish it, as the land is low in the vicinity.

Supplies.—Wood and good water, in small quantities, may be procured from the Bedouins, who bring these articles from Mowila and from the interior on camels for sale to the boats that put in here on their passage up and down the coast. Sheep at moderate prices may also be obtained.

Plan of Sherm Júbba, on chart 8a, Red sea, sheet 1.

SHERM JÚBBA (*Lat. 27° 33′ N., Long. 35° 32′ E.*), 3½ miles south-eastward from Sherm Yahar, is an inlet about 8 cables long, east and west, affording good anchorage; the entrance channel is only about half a cable wide, and the points of the coral reefs from either shore make it very tortuous. The depths are about 15 fathoms in the entrance, decreasing gradually to 6 or 7 fathoms in a space 1½ cables wide at the head, where there is good and secure anchorage. At 3½ miles from the shore, near Sherm Júbba, is the extensive bank with

Chart 8a, Red Sea, sheet 1. Var. 2° 20′ W.

shallow heads previously described, trending parallel with the shore for about 10 miles. Between this bank and the coast no bottom was found at 70 fathoms.

COAST.—From Mowila to Nomán island, the coast has a general south-south-east direction for about 35 miles, with here and there an occasional small inlet or sherm of which those requiring notice are Sherm Zibber and Sherm Kafafa, affording shelter to the native coasting vessels and boats.

Sherm Zibber and Sherm Kafafa.—At Sherm Zibber, wood may be procured, and water from some wells near the sea, but the anchorage is bad. At Sherm Kafafa, the anchorage is also bad; on its southern side is the village of Diba, consisting of a few small houses by the sea-shore and a fort. There is a very fair road from Diba to Mowila, but it ends near the latter place in a defile through which only one camel can pass at a time.

Abreast of these two inlets, and 3½ miles from the shore, is a reef 5 miles long and lying parallel with the shore. There is deep water between the rocky heads on the reef, and no soundings at 50 fathoms between the reef and the land.

NOMÁN ISLAND (*northern end, Lat. 27° 8′ N., Long. 35° 44′ E.*) is 4 miles long in a south-south-east direction, and one mile wide; on its eastern side is a small harbour, presently described. The island is low and sandy at the northern end, rising gradually to the southern end where it attains a height of about 400 feet in abrupt red limestone cliffs and hills. These hills are skirted by a few bushes, but are otherwise destitute of vegetation and of a very rugged appearance.

Reef.—From the northern end of the island, a reef extends in a north-north-westerly direction nearly 4½ miles, and is steep-to. Between Nomán and Ras Abu Massahrib on the mainland, distant 1½ miles, there is a navigable channel, but care must be taken to avoid several rocky patches in it. The mainland abreast of Nomán and also the land for 7 or 8 miles northward of it, nearly as far as Diba, is fringed by reef, which extends from 1½ miles to 2½ miles off shore.

Plan on sheet 3047, Sherm-en-Nomán.

Sherm - en - Nomán.—There is good, though limited, anchorage, in from 5 to 8 fathoms, coral, in Sherm-en-Nomán, about 1¼ cables wide, between the reef, nearly midway along the eastern side of the island. It affords shelter in all winds, as the shores, from 80 to 100 feet high, drop almost perpendicularly to the sea. In the winter, Bedouins from the

Plan on 3047, Sherm-en-Nomán. Var. 2° 20′ W.

mainland settle here, brining their camels and sheep for pasture. Anchorage, may also be found near the northern end of the island, but it is not recommended. A low woody point on the mainland, nearly abreast of the southern end of the island, affords good shelter for small craft from strong north-westerly winds.

Supplies.—The natives on the mainland are civil, and bring sheep and water for sale, but Europeans should be cautious and not go far inland.

Chart 8a, Red sea, sheet 1.

COAST.—From 7 miles northward of Nomán island to 30 miles southward of it, as far as Sherm Dumeigh, the shore is fringed by a reef having deep water close to its edge. Farther southward as far as the vicinity of Sherm Munnaiburra, there is no coast reef except for 3 or 4 miles on either side of Ras Morabit; but, in the offing, between Nomán and Sherm Habban, large patches of coral reef exist at distances from the shore varying from 2 to 8 miles. Between these clusters of reefs, deep channels exist, and on the banks are several low sandy islands near which vessels may find anchorage; but these reefs should not be approached too closely without the assistance of a native pilot, unless some previous experience of anchoring among reefs has been gained.

The coast is partly fronted by steep overhanging cliffs of coral and sandstone; from their base, for about 40 yards, there extends a level ledge of rocks, their outer part nearly dry and rising like a wall from a very considerable depth. Against this the sea, meeting with a resistance so abrupt, breaks at times with violence and produces a surf, which renders landing on the intermediate coast between the sherms almost impracticable.

About 10 miles inland is Jebel Antar (*Lat. 26° 33′ N., Long. 36° 27′ E.*), a conspicuous mountain, 3,733 feet high; on its centre are two small peaks, by which it is easily recognised from the sea. Between Noman and Wej, a number of low hills extend close down to the coral cliffs lining the shore.

Sherm Jezza (*Lat. 26° 57′ N., Long. 35° 57′ E.*) is a small inlet, where sheep may be obtained, but the anchorage is bad. The country in the vicinity is remarkably barren and destitute of vegetation; a stratum of black stone on the surface of the hills and plains gives the whole a bleak and desolate appearance.

Shab Massawik, the northern extreme of a bank with numerous reefs trending nearly parallel with the shore for 32 miles, lies 8 miles westward from Sherm Jezza.

General chart 2523.

Chart 8a, Red sea, sheet 1. Var. 2° 20′ W.

Depths.—There are no depths less than 65 fathoms between Shab Masswik and the shore, except a small 12-fathoms patch; but between the Shab and Nomán island a fringing bank extends a mile off-shore, where, in moderate weather, a vessel may anchor.

Mersa Zobaida is rather a large inlet, about 5 miles south-eastward of Sherm Jezza, but the holding-ground is bad, although the anchorage is well sheltered. Firewood is plentiful here.

Nabakiya, (*Lat. 26° 43′ N., Long 36° 1′ E.*) is a small low sandy island, covered with bushes and surrounded by a reef, lying nearly on the centre of the bank on which is Shab Massawik, before described. On its south-eastern side there is good anchorage.

Uweindiya is another low sandy island, about 300 yards long and 100 yards wide, on the same long bank as and 8 miles south-south-east from Nabakiya; a long narrow reef extends about 6 miles north-westward and one mile south-eastward from it. Between this island and Nabakiya are numerous rocky patches with deep water between, and there are many off-lying reefs westward and southward of it for a distance, respectively, of 2 and 3 miles. About 4 miles south-eastward from Uweindiya is the most distant rocky patch of those extending in that direction from this island. There is good anchorage on the eastern side of Uweindiya.

Plan on sheet 14, Sherm Dumeigh.

SHERM DUMEIGH (*Lat. 26° 39′ N., Long. 36° 12′ E.*).—This bay has an entrance about one cable wide, between Twigg and South points, both of which have fringing reefs steep-to, open to the south-westward, with about 30 fathoms water in mid-channel.

Within the entrance, the harbour is about 5 cables in extent and one cable wide between the 5-fathom lines.

The anchorage, in from 9 to 13 fathoms, good holding ground of soft sand and coral, is secure and well sheltered, the western side of the harbour being land-locked. In the north-western corner, the deep water extends to within 50 yards of the beach; but both on the north-eastern and south-western sides, shallow water extends some distance off; and, in the centre of the harbour facing the entrance, are some shallow coral patches.

Just within South point is a lagoon separated from the harbour by a reef connecting South point with East bluff, which reef dries at low water.

General chart 2523.

Plan on sheet 14, Sherm Dumeigh. Var. 2° 20′ W.

With the exception of a few bushes, there is no vegetation, nor any signs of habitation, nor is there any water. The nearest village is 6 miles distant; when visited about the year 1833, it contained about 40 people who were unwilling to part with provisions of any kind.

Directions.- Survey and remarks by Commander W. H. C. Selby, H.M.S. *Vestal*, 1878.

In approaching the harbour either from the northward or southward, keep well off-shore outside all danger, until Jebel Antar bears E. by N. ¾ N. On this bearing will be seen also four or five remarkable pyramid-shaped sandhills near the beach, southward of Jebel Antar. Steer for the mountain on this bearing until within a mile of the shore, and from thence to the northward for the entrance of the harbour, which may easily be recognised by Punch's cap, a remarkable hill with a rugged peak; *see* view on plan.

Steer for this hill on a north-east course until Mark rock, a conspicuous white rock on the beach within the harbour, is seen nearly below it. With the hill and Mark rock in line, bearing N. 43 E., proceed slowly through the entrance until North rock is just open to the left of Ass's Ears N. ½ E.; when it should be steered for until the south extreme of East Bluff bears S. 52 E., which bearing astern leads up the north-west arm until North Rock bears E.N.E., when a vessel should anchor in about 12 fathoms, or as requisite.

Vessels entering for the first time should send a boat ahead and mark the channel, in order to avoid the steep and dangerous patches near the centre of the harbour, and the shoal ground extending some distance eastward from the shore northward of Twigg point. The best time to enter is either when the sun is high or when it is astern; at low water, when the reefs are visible.

Tides.—The rise and fall observed from 5th to 12th July (full moon on 14th) was 2½ feet.

Chart 8a, Red sea, sheet 1.

COAST.—Sherm Antar, nearly 4 miles southward of Sherm Dumeigh, has good anchorage but is inferior to the latter harbour in that respect.

Chart 8b, Red sea, sheet 2.

Anchorage (*Lat. 26° 25′ N., Long. 36° 15′ E.*).—Good anchorage may be found at 3 miles from the mainland on the eastern side of a bank with rocky heads extending 5 miles in a south-south-east direction. The bank is about 2 miles wide.

General charts 8a, 8b, and 2523.

Plan of Sherm Wej on chart 8b. Var. 2° 20′ W.

SHERM WEJ (*Lat. 26° 13′ N., Long. 36° 27′ E.*).—The coast in the vicinity consists of coral cliffs from 50 to 70 feet high; between these and the hills, which are steep and about 3 or 4 miles inland, is a low plain, marshy near the sea, and covered with a saline incrustation.

The harbour is about 3 cables long in a north-easterly direction, rectangular in shape, and has an entrance 250 yards wide between the reefs in which there is a depth of 10 fathoms shoaling toward the shore; it is easy of access and no dangers bar the approach.

A few stone houses, forming the village of Wej, are on the northern side of the bay, and 100 yards farther eastward the fort makes a good mark for a ship entering the harbour, as does also a tower, 50 feet high, on the southern side of the bay. The island of Raikha, 7 miles west-south-west from the entrance, is also an excellent guide to the harbour.

Anchorage.—Sherm Wej, has good but confined anchorage, two-thirds of the bay being occupied by reefs and shallow water; the town or western side is fairly clear of reef. The best anchorage is in 6 fathoms about a cable S.E. by S. of the south end of the town. There is only room for one vessel of moderate size; such a vessel should moor head and stern close inside the northern point of the bay, where the bottom is of stiff clay; she is then clear of the swell which rolls across the entrance, and safe against a shift of wind to the southward and south-eastward which is often very sudden. Only small vessels have room to swing. The water shoals gradually towards the shore and towards the head of the bay. The tide rises about a foot.

Supplies.—At Sherm Wej water is scarce and brackish. Adequate machinery to condense 6,000 gallons a day has, however, been erected, to supply the want formerly felt. Sheep may be obtained at from one to one and a half dollars a head.

Depôt.—Fort.—About 6 miles eastward of Wej is a fort, nearly surrounded by hills, with a small Turkish garrison; this fort serves as a depôt for grain for the use of caravans going to Mecca. The natives who occupy this tract of country are of the Bili tribe; those near the coast are said to be civil, and gain a subsistence by supplying the Hajj, or pilgrim boats, with fresh provisions and water. The fishermen here belong to the Huteimi tribe, members of which are found all over the Red sea littoral. The number of pilgrims who pass through Wej annually is said to be very great.

General charts 8b and 2523.

Chart 8b, Red sea, sheet 2. Var. 2° 20′ W.

Ras Kharaba.—Reef.—From Sherm Wej the coast has a southerly trend for 4½ miles and then turns south-eastward for a similar distance to the entrance of Sherm Habbán. Off Ras Kharaba, and for 7 or 8 cables on either side of it, the fringing reef extends 5 or 6 cables from the shore, thus reducing the width of the channel between the shore reef and those extending south-eastward from Raikha island to about half a mile. An opening in the coast reef near the point affords a good landing place.

Raikha island (*Lat. 26° 10′ N., Long. 36° 21′ E.*).—Raikha is the north-western island of a group on a rocky bank, 10 miles in length, fronting the shore between Sherm Wej and Sherm Habbán. Between this bank and the shore is a good and safe channel, but, as just stated, only half a mile wide at its narrowest part. Raikha is low and rocky, gradually rising from its south-eastern end to a height of 50 feet in the middle and also at the north-western end. Good anchorage, in from 10 to 12 fathoms, may be found southward of the reef connecting Raikha with some islets eastward of it.

Mardúna island is on the southern extreme of the bank just mentioned, and 8 miles south-eastward from Raikha, though some authorities state that it, as well as Sherm Habbán, are 2 or 3 miles farther southward than as charted. It is 8 cables long in a south-south-easterly direction, and in some places only 100 or even 50 feet wide; it is remarkable for its appearance and formation, being in fact a narrow ridge of coral, in detached pointed masses, which vary in height from 200 to 300 feet and afford shelter to a great number of wild pigeons which breed on the island.

Tides.—At Mardúna it is high water, full and change, at 6h.; the rise is given as 3 feet, but only one foot is given for Sherm Wej to the northward

Plan of Sherm Habbán on sheet 30 17.

Sherm Habbán (*Lat. 26° 1′ N., Long. 36° 34′ E.*), 9 miles southward of Sherm Wej, affords good anchorage, in 4 to 5 fathoms, sand and mud, with shelter from all winds, being completely landlocked, with room for three or four small vessels. About 3 miles west-south-west from the entrance is the island of Mardúna, just described. Near, but inside the entrance, are several rocky patches easily distinguished by the discoloration of the water; these project from the south-eastern shore and narrow the passage to half a cable in which the depth is about 4¼ fathoms.

General chart 2523.

Plan of Sherm Habbán on sheet 3047. Var. 2° 20′ W.

Supplies.—Excellent water, firewood, and sheep may be obtained, at Sherm Habbán, at a cheap rate from the Bedouin Arabs.

Chart 8b, Red sea, sheet 2.

RAS KURKUMA (*Lat. 25° 53′ N., Long. 36° 38′ E. Var. 2 10° W.*).—From Sherm Habbán the coast trends eastward 4 or 5 miles, and then southward, forming the bay of which Ras Kurkuma, 400 feet high and gradually rising to its centre, is the southern horn. In the middle of this bay, from 2 to 3 miles off-shore, is a reef, 5 miles long north and south, and inshore of the reef is a channel of 20 fathoms and upwards. The shore in the bay is low and sandy, and in some parts pointed by low coral cliffs.

Anchorage.—Eastward of Sherm Habbán, 4 or 5 miles distant, is Sherm Munnaiburra, in the north-eastern angle of the bay just mentioned; good anchorage, in from 30 to 15 fathoms, with protection from north-westerly winds, may be found near the shore in this locality. Sheep, firewood, and excellent water, may also be obtained at this anchorage.

COAST.—From Ras Kurkuma to Ras Abu-Mad, a distance of nearly 70 miles, the coast is much indented, and fronted by a group of low sandy islets and reefs, connected with each other by extensive banks and extending 10 to 20 miles off shore studded with rocks. There are channels between them used by boats, but no vessel should venture to navigate amongst them.

Sheikh Mirbat island, 3 miles westward of Ras Kurkuma, is a low coral islet surrounded by reef; midway between it and the point is a rocky patch about a mile in extent. This island is famous among the Arabs, by whom it is much visited, as containing the tomb of Sheikh Mirbat, priest, who lived here for about 70 years.

The island is safe to approach; a bank with from 50 to 30 fathoms extends three miles westward of it; also in a north-north-west direction, with from 25 to 12 fathoms, joining the rocky island Marduna.

Anchorage.—There is good anchorage close southward of Sheikh Mirbat, leading into a channel amongst the reefs.

Howar, Umuruma, and Masabi.—Howar is a small low sandy islet. Umuruma is a low sandy islet, covered with bushes, about 5½ miles long in a south-easterly direction from its northern end. Masabi is a low and level coral island from 18 to 20 feet high, with coral cliffs fronting its western side;

Chart 8b, Red sea, sheet 2. Var. 2° 10′ W.

it is $5\frac{1}{2}$ miles long, north and south, and $1\frac{3}{4}$ miles wide; its western side is quite steep, having no soundings at 120 fathoms close to the cliffs, and there are no outlying dangers westward of it.

All these islands are on an extensive horse-shoe reef, its northern end closely approaching Sheikh Mirbat island, and its northern end being close to the north-western end of another extensive reef. Masabi is on the outer part of this horse-shoe reef, and 16 miles from the shore.

Sheibara island (*Centre, Lat. 25° 25′ N., Long. 36° 50′ E.*). —Close to the south-eastern extreme of the reef on which Masabi island stands, is another extensive reef having a length of 18 miles in a south-easterly direction, and Sheibara is on the south-eastern extreme of it. This island is low sandy and of coral formation, having many bushes on it; its length is about 6 miles and its width 2 miles.

A small reef surrounded by deep water lies $6\frac{1}{2}$ miles south-westward from the north-western point of Sheibara; and between Sheibara and the north-western extreme of the reef on which it stands, are numerous small coral islets.

Reef.—About 2 miles from the south-eastern end of Masabi, commences a serpentine reef which maintains a general south-south-easterly direction for about 12 miles and is from 15 to 20 miles distant from the nearest point on the shore. There are no known dangers westward of the reef; between it and the adjacent reef eastward of it the depths are from 10 to 20 fathoms.

Anchorage.—There is good anchorage and shelter on the eastern side of the southern point of the reef just mentioned.

Woghadi is a small coral island 3 miles south-eastward from Sheibara; it lies on a shoal and coral bank of the horse-shoe shape; in the bight of which, and under the south-eastern side of the island is good anchorage.

Outer reefs.—From 4 to 7 miles south-westward from Woghadi are several clusters of reefs arranged in a horse-shoe shape, 14 miles from the nearest land; the water is very deep near them.

Between the reefs and the island Hassani, nearly 20 miles farther south-eastward, are numerous rocky patches as charted.

Channel.—A channel between Sheibara and Woghadi leads into a gap amongst the inner reefs, and from thence amongst the reefs to the northward. It is used by most of the

Chart 8b, Red sea, sheet 2. Var. 2° 10′ W.

native boats but is much too narrow and dangerous for ordinary vessels, though the surveying vessel *Palinurus* passed through it twice.

Anchorages.—In the inner channel amongst the reefs from Ras Kurkuma to Woghadi island, there is good anchorage throughout; but no vessel should pass inside the reefs in this locality except for the purpose of picking up a temporary anchorage.

HASSANI ISLAND (*Centre, Lat. 24° 58′ N., Long. 37° 3′ E.*) is 4½ miles long, north-west and south-east, and about 2 miles wide. The island is 400 feet high at the centre and northern end, but slopes gradually down to a low southern point. It is about 9 miles to the mainland abreast of it, which here forms a deep bay, in which are several reefs and the two small islets Maliha and Umm Sahr. Northward and north-eastward of Hassani a long series of reefs, connected with those from the island, extend fully 15 miles in a general north-north-east direction; they consist of isolated rocks and sandbanks, with narrow and dangerous channels between them.

At 6 miles south-west from the centre of Hassani island is a small reef, steep to; and, 8 miles west-north-west from the same central point is another small reef, which is the westernmost shoal of several that lie off the western side of Hassani.

Anchorage.—There is spacious anchorage near the south-eastern end of Hassani in from 10 to 15 fathoms; but care must be observed not to haul too close round the south-western side, as a reef extends off about 1½ miles southward and south-eastward from the south-western point. The best anchorage is under the eastern side of the island, close to a large Arab village inhabited for some months in the year by people from the mainland. This anchorage affords shelter from all winds.

From it Umm Sahr islet, surrounded by a reef, lies east-south-east about 4 miles, and Maliha islet north-east 1½ miles from the anchorage.

Between the reefs extending from Umm Sahr, and Maliha there appears to be an opening leading into a large deep space, some 20 miles long, north and south, between the mass of reefs just described and the mainland shore. Opposite the opening on the mainland shore is the village of Emlidsch.

Supplies.—A scanty supply of sheep, wood, and water can generally be obtained at Hassani village, from the Arabs, who bring supplies from the mainland, which in this part is

Chart 8b, Red sea, sheet 2. Var. 2° 10° W.

rich in pasture and dates; but it is necessary to observe great caution in transactions with the natives. During the winter season, indifferent water may also be obtained at Hassani island, in small quantities, from some wells near a sheikh's tomb; brackish water can be had by digging a few feet in the sand.

During the warm season, the Arabs leave the coast for this island both to avoid the great heat of the continent, and to dispose of their grain, dates, &c., to the pilgrim boats which put in here. Abundance of fish can be obtained.

Tides.—It is high water, full and change, at Hassani island at 6h.

Libna is a small rocky island, 300 feet high, half a mile distant from the western side of Hassani. The channel between is foul and only fit for boats.

COAST.—From the part abreast of Hassani island, as far southward as Ras Mahár, the land fronting the sea is low and sandy in some places, but higher and rocky in others; from thence, it gradually rises to 100 or 200 feet, at which height it forms an extensive table-land. The face of this slope is intersected by numerous traces of torrents, which have divided and rent it in a very remarkable manner. The inland range of mountains, about 15 miles from the sea, takes the same direction as the coast and is of irregular height, varying from 1,500 to 2,000 feet; it is broken into detached hills of a pyramidal form, diverging to a considerable width.

RAS ABU MAD (*Lat. 24° 51′ N., Long. 37° 7′ E.*) is the low sandy extreme of the promontory of Abu Mad; between it and Hassani island, distant 7 miles in a north-north-west direction, are extensive rocky patches which, with Umm Sahr islet and its reefs, bound on the southern and south-eastern sides the anchorage inside Hassani, and the channel leading through towards Emlidsch village. At 1¾ miles westward of Ras Abu Mad is a shoal and rocky bank extending about 4 miles in a north-north-west and south-south-east direction.

Shab Ma Mubárak is a small shoal 5 miles south-west from Ras Abu Mad and is the outer shoal off this point; on its south-eastern side, between it and Abu Matari, there is anchoring ground.

The promontory of Abu Mad is skirted by reef as far southward as Sherm Habbán, a small anchorage half way between Ras Abu-Mad and Ras Mahár and not to be confused with the harbour of the same name nearly 90 miles to the northward.

General chart 2523.

Chart 8b, Red sea, sheet 2. Var. 2° 10′ W.

Ras Mahár, a low rocky point, is the commencement of the tract of table-land before mentioned, extending to the southward; it is about 80 feet high, the upper part overhanging the base very considerably. It has a small patch of rocks extending off it, under which native boats sometimes seek a precarious shelter from strong southerly breezes; but as these winds often shift to the northward, suddenly and without warning, it is never used except in case of necessity. A short distance southward of Ras Mahár is another similar bluff, but about 80 feet higher.

Abu Matari is a series of large and small reefs on the western side of a shoal bank of soundings, of which the northern end bears S.W. by S. 5 miles from Ras Abu Mad, from whence it extends 5 miles south-eastward, leaving a narrow channel between it and Shab Ma Mubárak on its north-western side. Between its southern end and Ras Mahár, distant 2 miles, is a deep channel; and on the eastern and south-eastern sides of Abu Matari there is anchorage for a small vessel. The water is very deep on the western side of these reefs.

Nearly due south from the centre of Abu Matari, and separated by a channel, 2 miles wide, is a bank with another cluster of reefs 3 miles long, north-north-west and south-south-east. A rocky patch detached from this bank lies 1½ miles eastward from the southernmost reef of the group.

Sherm Mahár (*Lat. 24° 41′ N., Long. 37° 14′ E.*).—The interior of this inlet, which is 3 miles from Ras Mahár in a south-easterly direction, is not very extensive, yet the entrance affords facility of egress rarely met with in other inlets along the eastern coast. Moderately high table-lands approach close to the sea; a remarkable gap in them, forming a deep valley, points out the harbour. This valley is extensive and spreads out to a considerable width as it advances into the interior; the lower part is covered with bushes, and along it, about a mile from the beach, are some straggling palm trees. The valley presents an extraordinary appearance, not unlike the dry bed of a river; the upper part of the hills or banks on either side overhang very considerably, and many large fragments, detached during the course of time, lie scattered in the valley.

There is good anchorage in Sherm Mahár in 7 fathoms, sandy bottom, with shelter from north-westerly winds. Sheep are to be obtained from the Bedouins but water is scarce.

General chart 2523.

Plan of Sherm Hassey on chart 8b. Var. 2° 10′ W.

SHERM HASSEY (*Lat. 24° 38′ N., Long. 37° 18′ E.*).—The northern half of the harbour is choked by reefs, as is also nearly half of the eastern part of the remaining portion, leaving a passage from the outer to the inner anchorage only about two-thirds of a cable wide.

The outer anchorage, lying in a north and south direction, is not recommended as the space is contracted, the depth of water 17 to 30 fathoms, and the bottom foul; but from it the channel turns north-eastward and forms a good inner anchorage in a basin 1½ cables in diameter, with from 5 to 7 fathoms water.

About a mile from the beach are some wells, but the water is of very indifferent quality, and, in consequence, the Bedouins do not remain in this locality.

Chart 8b, Red sea, sheet 2.

PALINURUS REEF, or Shab Shoaiba (*Lat. 24° 28′ N., Long. 37° 11′ E.*), is a group of reefs about 4 miles in extent, surrounded by deep water, and with no anchorages. From the north-western reef, the nearest point of the coast is 11½ miles distant; W. by N. 4 miles from this reef, and 15 miles from the nearest land, is a detached patch; several other detached patches lie south-westward of the main body of the reef, the outermost being nearly 3 miles distant. Being at so great a distance from the shore these reefs are dangerous for a vessel to approach at night. On the southern end of the large reef is a small rock above water. A good mark for pointing out these reefs is, Scragged hill on with the northern brow of Rudhwa mountains.

Banks.—A number of shoal patches on rocky bank, commences from a position 2½ miles south-westward of Sherm Hassey and runs nearly parallel with the shore for 15 miles; from its outer edge, the shore is distant 4 or 5 miles. There is good anchorage inside the large reef near the northern end of this bank, and amongst the reefs generally are to be found anchorages of an indifferent kind.

Shab Kurush, or **Shark reef** (*Lat. 24° 22′ N., Long. 37° 20′ E.*), is 2 miles from the southern extreme of the rocky bank just described. From the nearest point of Palinurus reef, Shark reef is distant 9 miles in a south-easterly direction; and it lies 4 miles from the nearest point of the mainland.

CAPE BARIDI is a moderately high promontory forming a curve to the westward about 7 miles in breadth,

Chart 8b, Red sea, sheet 2. Var. 2° 10′ W.

The shore is bounded by steep coral cliffs, having no bottom at 30 fathoms. Inland, northward and eastward of cape Baridi, is a remarkable range of broken hills of moderate height, and, more distant, the lofty Rudhwa mountains all of which are presently described.

COAST.—Ras Jerbóa lies 11 miles eastward of cape Baridi; at 7 miles from the latter, the coast falls back to the northward forming a deep bay 4 miles wide, encumbered by reefs and islets; Ras Jerbóa, the south-eastern point of this bay, is low and sandy, as is the shore generally from thence to Yenbo, a distance of 22 miles, the trend of the coast line being about south-east. During the whole of this distance the shore is fringed by a reef about one mile wide, broken only at Sherm Yenbo, 8 miles north-westward of Yenbo.

MOUNTAINS.—Rudhwa range, 44 miles from cape Baridi in an east-north-east direction, and rising 6,000 feet above the sea, is the highest point of this remarkable range of table mountains. Between this range and the shore is a group of dark-coloured hills, generally about 500 feet high, the valleys between which are filled with light-coloured sand from the surrounding desert.

The Sugarloaf (*Lat. 24° 34′ N., Long. 37° 32′ E.*), the westernmost hill of any prominence, as viewed from cape Baridi, lies 17 miles northward of that cape; Scragged hill, 9 miles eastward of the Sugarloaf, lies 18 miles north-eastward from the same cape, and Cliff hill is seen between them. These hills are very conspicuous from a vessel nearing the shore and are seen under the high land north-eastward of them, which is part of the range of mountains extending from the neighbourhood of Yenbo as far north-westward as inland, and abreast of Hassani island; in the centre of the range is Round mountain, higher than the rest, in lat. 24° 43′ N., long. 37° 55′ E.

Anchorage may be found eastward of the reefs off Ras Jerbóa, between them and some small islands which lie across the mouth of the bay before described, of which Ras Jerbóa is the southern boundary. The *Palinurus* anchored inside these islands, and at that time (1834) the native pilots were well acquainted with that part of the coast. Anchorage is generally to be found about 200 yards inside any of the islets, which are in fact merely ridges and labyrinths of reefs, connected by an extensive bank of soundings.

Care is required in approaching the coast hereabouts, as detached rocks lie near the shore for several miles south-eastward of Ras Jerbóa; whilst in the offing they lie in broken

Chart 8b, Red sea, sheet 2. Var. 2° 10′ W.

patches from the western shore of the bay round to the bearing of south from Ras Jerbóa at from 5 to 7 miles from that cape. The fringing reef on the eastern side of the bay extends upwards of 1½ miles off-shore, and there are several outlying patches. A stranger should not attempt this anchorage without the assistance of a native pilot.

Sherm Yenbo (*Lat. 24° 10′ N., Long. 37° 55′ E.*), 24 miles east-south-east from cape Baridi, is a capacious inlet, incomparably the best harbour on the coast between Ras Muhammed and Jidda, being easy of ingress and egress for sailing vessels. The inlet consists of three arms, of which the northern and longest extends 5 miles inland.

Depths.—There are depths of 20 fathoms at the entrance, decreasing to 10 and 8 fathoms a short distance in, so that a sailing vessel becalmed outside might anchor at the entrance.

Schermo.—Beacon.—This rocky patch, which is said to extend at least 1½ miles northward of the beacon, lies 6 miles S.W. by S. from the entrance of Sherm Yenbo; the beacon on it consisting of an iron column, on a masonry base, and is surmounted by a ball 30 feet above the sea. It is not to be relied on.

Reef.—About 3 miles south-south-east from the Schermo beacon is a second patch, also a third, reported in 1906, with apparently about 3 fathoms over it, about south-south-west 3 miles from the Schermo beacon. These patches must be carefully avoided, as the water is very deep around them.

Plan of Yenbo on chart 8b.

YENBO (*Lat. 24° 5′ N., Long. 38° 3′ E.*).—Yenbo is the port of entry for Medina, the burial-place of Muhammed; it is governed by a Turkish Effendi and has a garrison of about 500 men. The town stands on a low sandy shore destitute of vegetation, on the northern side of the harbour, 5 cables within the entrance. The high houses and mosque may be seen about 13 miles distant. Cattle and water may be obtained and are both cheap and good.

Population.—Trade.—From the continual arrival and departure of pilgrims to and from Medina, the population of Yenbo varies greatly; the number of actual residents in 1835 was estimated at 2,000, including the Turkish garrison, and no later estimate is available. Its commerce is of small importance compared with that of Jidda, but a share of the trade of central Arabia is absorbed by Yenbo, the natural port for

Plan of Yenbo on chart 8b. Var. 2° 10′ W.

Medina and Nejd, and the harbour is now visited by Egyptian, British, Turkish, and Austrian steamers. About 1,500 houses, many in a state of decay, occupy a space of considerable extent, enclosed by a loop-holed wall, now also in ruins. The inhabitants are mostly Arabs of the Joheinah tribe.

The revenue of Yenbo is derived exclusively from the customs, the duties being nominally fixed at 10 per cent. The imports consist of articles required for the consumption of Medina and the northern ports of Hedjaz, and are mostly grain, coffee, and articles of dress.

Harbour Entrance.—Depths.—The entrance to Yenbo inlet is about 1½ cables wide between the reefs. The water is deep just outside, but in the entrance the depths decrease rapidly from 15 to 8 and 6 fathoms; off the town the anchorage is in from 4 to 6 fathoms and the width available is 1¼ cables.

A reef forms the southern side of the harbour; and, from the opposite side, a tongue of reef extends to mid-channel in a south-westerly direction from the southern part of the town, so that although the harbour apparently opens out considerably within the entrance, its navigable capacity remains about the same, and the south-eastern side has to be kept aboard to avoid this tongue.

A conspicuous white tomb stands on the low sandy point forming the northern side of the harbour; and a small sandy island, covered with bushes, having the ruins of a sheikh's tomb near its eastern end stands on the broad bank of the reef forming the southern side.

Directions.—Approaching the harbour, by passing northward of Schermo beacon, a vessel will avoid the charted dangers southward of it. Pass between the entrance points on a north-easterly course, and then immediately keep to the eastward with the southern side of the harbour aboard, to avoid the tongue of reef extending into mid-channel from the northern shore, after passing which she should keep to the north-eastward again, anchoring off the southern part of the town as below mentioned.

The reefs are easily seen if the light is favourable, and after about 9 a.m. the sun is high enough to render them visible. A patch of rocks, on which the south-eastern swell breaks very heavily, bounds the southern side of the entrance.

Sailing vessels can only enter this harbour with a fair wind, and the rocks on the southern side of the entrance make the harbour difficult to quit when north-westerly winds have been prevalent, the land wind in the morning being scarcely sufficient to carry a vessel out against the swell.

General chart 2523.

Plan of Yenbo on chart 8b. Var. 2° 10′ W.

Anchorage.—The best anchorage in Yenbo is nearly abreast of the landing-place for pilgrims, in about 5 fathoms, the bottom being muddy sand, and good holding ground, the anchor sinking gradually to a considerable depth.

Chart 8b, Red sea, sheet 2.

Kabriya reef lies south-west 4 miles from the entrance of Yenbo, and is about 1½ miles long by one mile wide. From its centre, a small patch of rocks bears E. by N. 2¾ miles, and another small patch N.W. ¾ W. 1½ miles. Between these reefs and the mainland there is deep water, as also between Kabriya reef and its outlying patches.

COAST.—From Yenbo to Sherm Bureika (*Lat. 23° 37′ N., Long. 38° 30′E.*), 38 miles farther south-eastward, the coast is low, marshy, and thickly overrun with mangrove trees. Yenbo is principally supplied with firewood from this tract; beyond it, the country continues low for a considerable distance, and, as it recedes from the shore, appears to be composed of a fine light sand, which has filled up the valleys and blown up the sea faces of the numerous hills that rise in sharp conical peaks. Though several of these are from 500 to 1,000 feet high, yet the sand has collected in such prodigious quantities as to reach the summit of the highest, in many places leaving the upper parts of the black peaks discernible, and from thence descending in a solid mass with a moderate inclination to the plain.

From Yenbo to Sherm Bureika, the coast is fringed by a reef having occasional breaks, in which bágalas or native boats find shelter and anchorage at night.

OUTLYING REEFS.—**Kabriya reef** is on the northern end of a bank which extends in a south-easterly direction for 26 miles; on it are numerous rocky patches, the outer ones being upwards of 9 miles from the nearest shore. Between these patches there is deep water, and also an in-shore passage between the eastern detached shoals and the coast reef.

Shah Sabah, or the **Seven shoals** (*Northern shoal, Lat. 23° 53′ N., Long. 37° 54′ E.*).—This shoal lies with its north extreme 14 miles south-westward from Yenbo. The Seven reefs occupy a space about 9 miles long in a south-easterly direction and are about 2 miles wide; they are about 18 miles from the nearest land, and there is no bottom at 100 fathoms close westward of them.

Thetis, or **Mansi reef.**—**Beacon** (*Lat. 23° 39′ N., Long. 38° 2′ E.*).—This small rock shows several heads, 2 or 3 feet above water, at times but is practically awash at high water. It lies S. by E. 8 miles from the southernmost of the Sabah reefs.

Chart 8b, Red sea, sheet 2. Var. 2° 10′ W.

An iron cage beacon about 27 feet high was erected on Thetis rock in January 1908, in lieu of one previously destroyed, but it is not to be depended on; it should be of great service to vessels approaching Yenbo from the southward.

There is no bottom at 100 fathoms near to the reef.

Shab Suflani, its north-western edge, lying about 12 miles south-eastward from Thetis reef, is a narrow reef about 2½ miles long in a south-easterly direction, with very deep water close-to. It is awash at high water, with a few boulders showing 2 or 3 feet above water near its western edge.

Reefs.—Between Shab Suflani and the coast abreast Sherm Bureika, and about 5 miles eastward of the former, is a rocky bank, 18 miles long, north and south, 7 or 8 miles wide, with many reefs on it. Between this bank and the coast reef is a channel from 2 to 3 miles wide, and nearly midway along it is Sherm Bureika. The rocky patches on this bank are very numerous with indifferent anchorages amongst them, but with deep water close to the edge all round.

Anchorage.—Ras Majiz (*Lat. 23° 49′ N., Long. 38° 24′ E.*). — There is good anchorage in a bight of the coast reef southward of this point, which is 26 miles south-eastward of Yenbo.

Sherm Bureika (*Lat. 23° 37′ N., Long. 38° 30′ E.*), 38 miles south-eastward of Yenbo, has an entrance not more than 50 yards wide, but, as the water in the channel is perfectly smooth and the rocks on either side rise perpendicularly, the passage is not attended with danger. From this narrow gut the interior spreads out into an excellent harbour of sufficient extent to afford anchorage in 3 or 4 fathoms, for five or six small craft. With the exception of a narrow boat channel on the northern side, the upper part of this inlet is choked by an extensive flat, dry at low water. The boat channel leads to a low channel on which are the ruins of a fortified town.

Supplies may be obtained here, but the natives are not to be trusted.

Ras el Abyad, 5 miles southward of Sherm Bureika, is a low sandy point (a fringing reef, wider than in adjacent parts); a rocky patch lies 3 miles west-south-west from the point.

Eastward of Ras el Abyad is a bight known to the natives as Mersa Sabir. It is about 5 miles across, contains numerous reefs, but affording safe anchorage for many small craft having once entered.

General chart 2523.

Chart 8b, Red sea, sheet 2. Var. 2° 10′ W.

Coast reef.—From Ras el Abyad, the coast reef continues as far as Sherm el Kharrar, where it terminates after having fringed the shore for upwards of 120 miles without any important break. For a distance of over 30 miles between Ras el Abyad and the low sandy point Ras Mastura, shoal and rocky patches extend from 4 to 7 miles from the shore. Close to the edge of the bank on which these patches lie, there is no bottom at 30 fathoms.

KHARRAR REEFS (*Northern extreme, Lat. 23° 6′ N., Long. 38° 41′ E.*).—These reefs occupy the greater portion of a bank 18 miles in length, north and south, by 9 miles in breadth. They consist chiefly of large clusters of reefs with passages of moderate depth between. The outer reefs are 9 or 10 miles from the shore, and between the eastern side of the group and the shore is a channel from 1½ to 2½ miles wide, having no bottom at 30 fathoms.

Shab el Khamsa (*Lat. 22° 47′ N., Long. 38° 47′ E.*) lies about 7 miles westward of the south extreme of Kharrar reef and is about 2 miles in extent with four small shoals lying close together; there is no bottom at 40 fathoms close eastward of them. At 3 miles eastward of them in line with the southern end of the Kharrar reefs, is a rocky patch with no bottom near it at 50 fathoms.

Jebel Subh (*Lat. 13° 18′ N., Long. 39° 2′ E.*) is a remarkable mountain 17 miles inland, and about 4,500 feet high; it is the highest land between Jidda and Yenbo, and can be seen about 40 miles off in clear weather. The upper part forms a convex line with two small peaks near the centre. A range of very high land extends some distance north-north-eastward from Jebel Subh with several remarkable peaks on it; but these are seldom seen far at sea unless the atmosphere is unusually clear. The summit of Jebel Subh is the stronghold of the Beni Subh, a fierce and warlike race of Bedouins, a branch of the great Harb tribe, who inhabit its fastnesses and are divided into smaller clans.

Plan of Sherm Rabegh on chart 8b.

SHERM RABEGH (*Lat. 22° 44′ N., Long. 39° 0′ E.*) is an inlet, about 2 miles long, affording excellent anchorage in from 8 to 12 fathoms, perfectly sheltered from all winds and easy of ingress and egress to sailing vessels during north-westerly winds. In the entrance are depths of 18 to 20 fathoms, and, immediately outside, no bottom with 30 fathoms. Rabegh is a sacred spot to Mussulman pilgrims, who here disrobe and put on the white garb of pilgrims.

General chart 2523.

Chart 8b, Red sea, sheet 2. Var. 2° 10′ W.

At Rabegh, at the time of the survey in 1834, wood, water, and other supplies were obtained at a cheap rate, but the Bedouin Arabs were not to be implicitly trusted. An extensive date grove and several villages are to be found about 5 miles inland.

Shab el Abyad.—About 10 miles westward from Sherm Rabegh is the eastern end of this large reef, about 3 miles in extent, north-west and south-east, and having no soundings near it at 30 and 40 fathoms.

Chart 8c, Red sea, sheet 3.

Jebel Rahab (*Lat. 22° 32′ N., Long. 39° 25′ E.*).—From 15 to 20 miles inland is a range of mountains, of which the most conspicuous and nearest is Jebel Rahab, a double bluff hill with precipitous sides.

REEFS.—From Sherm Rabegh, a shoal and rocky bank, with passages and anchorages amongst its numerous reefs, extends south-south-westward for 24 miles, where it ends in Shab Nazar, on the north-eastern side of which reef is indifferent anchorage. The western edge of this bank preserves nearly a straight line, and there is no bottom outside it at from 40 to 50 fathoms.

The bank of reefs is from 2 to 5 miles wide; its north-eastern part is about 1¼ miles from the shore, a little southward of the entrance to Sherm Rabegh; westward of Ras Malak and off Ras el Khurmá, the inshore channel is nearly 5 miles wide, but immediately southward of Ras Malak the reefs extending northward from Haramil island narrow this passage to less than 2 miles. A rocky shoal lies about mid-channel off Ras el Khurmá, but in all other parts no bottom has been found at from 40 to 50 fathoms.

Abu Sahim shoal (*Lat. 22° 38′ N., Long. 38° 54′ E.*).—A little westward of the northern end of the large bank of reefs just described, is this bank, under shelter of which there is good anchorage, during north-westerly winds.

Shab Nazar, about 3 miles in extent, is situated at the south extreme of the large bank above mentioned, at about 18 miles southward of Abu Sahim.

A small patch, steep-to, lies about 2 miles south-east from Shab Nazar.

Mersa Dheneb, 8 miles southward of Sherm Rabegh, has good anchorage in from 7 to 10 fathoms. All this part of the coast is a low sandy desert.

General chart 2523.

Chart 8c, Red sea, sheet 3. Var. 2° 10′ W.

COAST.—Between Ras el Khurmá and Ras Malak, both of which points are low and sandy, there is a deep bight encumbered with shoals. From Ras Malak, the coast takes a more south-westerly direction for 21 miles to Ras Hatiba, and between them are various mersas or anchorages of considerable extent, but difficult of approach on account of the numerous reefs and shoals with which this shore is bordered, and which extend from 6 to 8 miles off-shore; there are, however, some channels among them, which will be better understood by reference to the chart than by following a description of them.

Haramil island lies west-south-west 7 miles from Ras Malak; it is a sandy islet about 200 yards long, covered with bushes, and about 10 or 12 feet high; it is merely an accumulation of drift on the upper ridge of a reef. The northern extreme of the shoal and rocky bank on which it stands is distant from the island 5 miles in a north by west direction. Westward of the island is a long reef extending north and south about 6 miles, and separated from Haramil by a channel 1½ miles wide. Nearly opposite this island on the mainland is the Bedouin village Tuwal, containing about 200 inhabitants, who subsist by fishing and collecting pearls. Of the latter, however, the northern part of the Red sea furnishes but a scanty supply.

Ras Hatiba is situated in lat. 22° 0′ N., off which reefs extend about 11 miles.

In 1901 an Italian cruiser, of 21 feet draught, attempted to enter the harbour lying eastward of Ras Hatiba but could find no channel. From Ras Hatiba the coast continues low and sandy, the high land in the background presenting nothing remarkable in appearance.

Aikah, about 3 miles northward of Ras Hatiba, is a small low sandy island almost enclosed by reefs.

Sherm Ubhur (*Lat. 21° 42′ N., Long. 39° 5′ E.*) is an inlet about 8 miles in length. The entrance, about 15 miles northward of Jidda, is narrow, varying in width from three quarters of a cable to 2½ cables for some distance, when it widens out into some beautiful bays; at the head of the harbur is a marsh extending several miles into the interior.

The anchorage is on the northern bank, about 5 cables within the entrance, and about one cable inside a rocky point, which should be rounded as near as the patch running off it will admit; with the exception of this point, the extreme end of which may be easily discerned, the passage inside, as well as the shore about the entrance, is free from dangers.

General chart 2523.

Chart 8c, Red sea, sheet 3. Var. 2° 10′ W.

This anchorage, however, is not recommended for a sailing vessel, as it is difficult to quit with a light land wind if there is any swell at the entrance, which is generally the case after strong north-westerly winds. In other respects a vessel may lie quite landlocked inside, with scarcely room to swing, except in the upper part.

ELIZA SHOALS.—These extensive shoals are a continuation of the group extending southward from Ras Malak, and from abreast of Ras Hatiba. They occupy a space about 28 miles long, north and south, by an extreme width of 11 miles. There is a deep Inner channel between the bank on which they stand and the shore; and close to the western side of the bank for its whole length, there is no bottom with 70 fathoms of line. At the southern and south-western edges of the bank, and at intervals along its western and north- are breaking reefs, of which the most important are presently described.

Abu Madafi reef is situated at the north-western extreme of the bank on which are also the Eliza shoals, at about 11 miles from Ras Hatiba; it is about 4 miles long in a north-easterly direction, and very narrow. There is good anchorage under the south-eastern side of the reef, with shelter from north-westerly winds. A reef is charted 3 miles S.S.E. of Abu Madafi reported by s.s. *Arethusa* in 1879.

Abu Faramish.—About 12½ miles south-westward from Ras Hatiba, and within the western edge of the bank on which the Eliza shoals lie, is the northern extreme of this shoal, which is narrow and about 2½ miles long in a south-south-westerly direction. There is good anchorage near its centre on the eastern side.

Shab el Kebir.—Beacon (*Lat. 21° 40½′ N., Long. 38° 50′ E.*).—This reef at the south-western extreme of the bank on which are the Eliza shoals; it is about 3 miles long in a north-north-west direction, and is marked near its centre by an iron column, 30 feet high, surmounted by a ball, 6 feet in diameter and painted red; this beacon should be seen in clear weather 8 miles distant but is not to be depended on.

From it, the entrance to Sherm Ubhur is 14 miles distant, in an easterly direction across the bank; and El Harig, the principal entrance channel to the port of Jidda, bears S.E. 21 miles. From Shab el Kebir the bank, with isolated patches, extends 3 miles to the south-eastward, with deep water between and amongst them.

General chart 2523.

Chart 8c, Red sea, sheet 3. Var. 2° 10′ W.

INNER CHANNEL.—If a good look-out is kept a vessel from the northward, with the sun in a favourable position, may with safety take advantage of the Inner channel between the bank on which lies the Eliza shoals and the low sandy shore fronting them, but it is not recommended to those who have no experience in navigating amongst coral reefs, except in case of necessity.

It is from one to 3 miles wide, with no bottom at 60 or 70 fathoms, and both sides are steep-to. Should night come on before a vessel is through, she may haul a little to the westward and anchor as convenient under the lee of any of the reefs, bearing in mind that the range of reefs on the western side of this channel on which anchorage may be had, terminates in lat. 21° 46′ N., about 10 miles southward of Ras Dha-l-lama; in which position the Sisters, two remarkable hills with peaks 1,900 and 2,070 feet high, the northernmost high lands near the shore in this part, bear about east and E. by S. Southward of this for 6 miles, there are only a few patches which do not afford good shelter from north-westerly winds.

The northern entrance to the Inner channel is close past the south-western end of Abu Madafi. An E. by S. ½ S. course for 8 miles, with depths of from 40 to 10 fathoms, leads into the Inner channel; a course may then be steered close along shore to the reefs off Jidda.

Katah Dukeis is a large patch of reefs on the western side of the Inner channel just mentioned, having deep water close-to. Its northern end lies 6 miles westward of Ras Hatiba.

Plan 2599, Jidda and approaches.

COAST.—From Sherm Ubhur, the coast trends southward 11 miles to Ras Gahaz, the northern extreme of the bay of Jidda, of which Ras al Aswad, 10 miles farther south, is the southern boundary. This bay is much encumbered and fronted by reefs with navigable channels between them. Amongst them are the anchorages and inner harbour of Jidda; the town of Jidda, now to be described, lying on the sea-shore in the north-eastern part of the bay.

JIDDA APPROACH.—General remarks.—Reefs.—Jidda is so well protected by lines of reefs that there is comparatively smooth water whatever the direction or force of the wind. The outlying reefs form three nearly parallel lines, 10 miles long, north and south, filling up the bay from Ras Gahaz on the north to Ras al Aswad on the south.

There are also many outlying patches, between which are channels navigated by native pilots but the recognised tracks passing through what are named the gateways, are the only

Plan 2599, of Jidda and approaches. Var. 2° 10′ W.

ones described in these directions, as it is these alone which a stranger can take with safety.

Tides and currents.—There is a regular tidal range, but it is small compared with the irregularities in sea level caused by wind, and no established time of high water can therefore be fixed. In December and January 1833-4, when the harbour was surveyed by Captain Elwon, the greatest rise or fall, at springs, was about 2 feet; but in the summer months, during northerly winds, when many of the banks are dry, there is less water by about 3 feet than during the southerly winds of the winter season; and, in January 1880, during a strong northerly gale, lasting five days, the water in the harbour actually fell about five feet.

In November and December 1876, when the harbour was re-surveyed by Commander Wharton, a constant northerly set was experienced outside the reefs; but, inside, the currents observed were weak and irregular.

Chart 8c, Red sea, sheet 3.

LANDMARKS.—The landmarks by which to identify the position of Jidda before the town can be seen are not easily distinguished by a stranger. The mountains beyond the great plain extending inland from the town are so rugged and uneven that it is difficult to identify the peaks; the principal mountains are, however, now described, though it may be premised that from a position outside the dangers, when in or near the latitude of Jidda, the town can generally be seen, and bearings of it suffice to lead a vessel up to the vicinity of the beacons. (*See* view on 2599.)

Jebel Umm Arar, 580 feet high, is the hill in the range northward of Jidda, showing most to the left or approaching from the southward, and forming the termination of some spurs running westward from the inland mountains. The Sisters, about 2,000 feet high, north-eastward of it, have been described.

Jebel Yemeniya, or The Sugarloaf, is a conical hill, 920 feet in height, in the second range behind, and 8 miles eastward of, the town; it is much used as a mark, and may be recognised easily when the town is on an easterly or north-easterly bearing, when it is the nearest remarkable cone behind the houses.

Jebel Haddah, or Saddle hill, is the highest and most remarkable of the nearer high hills, and as the loftier range behind Mecca is seldom visible, it is generally the highest land to be seen. It shows as a double peak with a saddle between, is 2,650 feet high, and lies 18 miles eastward of Jidda.

General chart 2523.

Chart 8c, Red sea, sheet 3. Var. 2° 10′ W.

Jebel Sannam, 960 feet high, lies 10 miles south-eastward from the town, and is a small but remarkable pyramidal peak, surmounting a flat hill. It maintains nearly the same appearance from all points of view, and from abreast of Musari reef bears E. ½ N.

Jebel el Moya, 4½ miles west-north-west from Jebel Sannam, is a low black rounded hill forming the southern extreme of the range nearest to the shore. It may be known by its black colour, and by being at the end of the white sandhills lining the foreshore.

OFF-LYING DANGERS.—Musari reef is a breaking patch bearing W. ½ S. 6½ miles from Ras al Aswad, and S.W. ⅞ W. 5½ miles from Maruwas reef. Close westward of the Musari reef there is no bottom at 120 fathoms. This reef is generally sighted by vessels approaching from the southward, as its breakers show well.

Plan 2599, Jidda and approaches.

ROCKY BANK.—The westernmost and outer bank off Jidda, near the edge of the 100 fathoms line, is rather more than 2 miles in extent, north and south, and nearly the same width; there are seven known and named separate shoal heads on the bank, of which at least five are dangerous. This bank is separated from the inner group of reefs by a fair open channel, 2 miles wide, with from 30 to 40 fathoms, but falls abruptly to very deep water on its northern, western, and southern sides.

Abu Nakla, the southern head, lies about 8 miles north-eastward from the Musari reef, has 1½ fathoms water, and bears W. by S. ¼ S. nearly 2¾ miles from the white stone beacon on Gaham, which is the outer beacon in the approach to Jidda.

Al Wastani, with 1½ fathoms, lies 3 cables N. by W. from Abu Nakla.

Both these shoals break when there is any swell; and there is a depth of 14-fathoms between them. The 100-fathoms line of soundings is less than half a mile westward of them, and between it and them are very irregular depths with patches of from 9 to 4 fathoms.

The other five heads are on the northern part of the bank.

Al Khruba Baharia, the westernmost, has a least depth of 6 fathoms with irregular depths of from 9 to 18 fathoms around; it lies 1 2/10 miles N.W. ½ N. of Al Wastani.

Al Fokani, with 2½ fathoms, lies 6½ cables N.E. by E. ¼ E. of Al Khruba Baharia.

General chart 2523.

Plan 2599, Jidda and approaches. Var. 2° 10′ W.

Abu-l-Khodar, about half a cable north-eastward of Al Fokani, is a small 3-fathoms head with from 7 to 10 fathoms close-to.

Erg ar Suniya, with 3¼ fathoms and from 9 to 27 fathoms close-to, lies 4½ cables N.E. ½ E. of Abu-l-Khodar.

Abu-l-Yahud, with 5 fathoms, lies 4 cables E. by N ¼ N. from Erg ar Suniya. This, the north-eastern shoal patch of the Rocky bank, bears N.W. by W. ¼ W. 2½ miles from the Gaham beacon. Only 2½ cables northward of Abu-l-Yahud the depth is 230 fathoms.

Plan 2599, Jidda and approaches, and chart 8c, Red sea, sheet 3.

Clearing marks.—Jebel Yemeniya or The Sugarloaf, open the breadth of the town southward of it, N. 70° E., leads one mile southward of Abu Nakla, the southernmost shoal head of the Rocky bank.

Jebel Yemeniya, open the same distance northward of the town, N. 82° E., leads half a mile northward of Abu-l-Yahud, the northernmost danger on the bank.

Jebel Yemeniya, on with centre of the town N. 76° E., leads in a fairway over the Rocky bank between Al Wastani and Al Khruba Baharia, in apparently not less than 13 fathoms, but this passage is not recommended, as the neighbourhood has not been surveyed in detail.

Jebel Umm Arar, the western end of the range northward of Jidda, before described, bearing N.N.E. ½ E., leads inside Abu Nakla, the inner danger on the Rocky bank, between it and Maruwas reef

Anchorage.—In fine weather, a vessel arriving off the harbour too late to enter, will find anchorage on the Rocky bank eastward of the dangers. This anchorage is better than that outside the gateways, though the bottom is but coral and sand.

Plan 2599, Jidda and approaches.

OUTER LINE OF REEFS.—Southward of El Harig, the fairway to the gateways, this line of reefs, situated on the eastern side of the fairway from the southward, consists of the breaking patches of Gaham, Shab Jidda, Umm el Kat, Assamdiya, which are nearly in line about north by east and south by west and always show; and, the sunken patch Maruwas. Northward of El Harig, all the reefs of the outer line break.

Gaham reef.—Beacon.—The Gaham reef is the southern boundary of El Harig, the channel generally used in entering Jidda harbour. A white stone beacon, surmounted by a staff and globe, 20 feet high, and visible 5 or 6 miles, stands

General charts 8c and 2523.

Plan 2599, Jidda and approaches. Var. 2° 10′ W.

$1\frac{1}{4}$ cables within the northern end of the reef. From this beacon, the Middle gateway red beacon, on the opposite side of the fairway, bears N.E. by E. nearly $1\frac{1}{2}$ miles.

A shoal, with $2\frac{3}{4}$ fathoms over it, lies north-eastward of Gaham shoal, with Middle gateway red beacon bearing N. 39° E. $5\frac{1}{2}$ cables. A 5-fathoms patch lies $1\frac{1}{2}$ cables southward of this shoal. Both have from 10 to 20 fathoms within half a cable of them all round.

Shab Jidda, the next reef southward of Gaham reef, is connected with that reef by an almost continuous chain of rocks, but there is a channel between Shab Jidda and Umm el Kat; it however can only be used by the eye and requires local knowledge. Assamdiya lies between Umm et Kat and Maruwas.

Maruwas, the southernmost of this line of reefs, is a small one-fathom bank N.E. $\frac{3}{4}$ E. $5\frac{1}{2}$ miles from Musari reef (page 320), and S. 20° W. distant 3 miles from Gaham beacon. As it lies rather outside the line of the four reefs just mentioned, and does not generally break, it is dangerous for a vessel approaching from the southward. One clearing mark has just been given, and as the Gaham beacon can always be seen, though Jebel Umm Arar may be hidden, this sunken patch may be cleared by steering for that beacon when bearing N.N.E., or eastward of that bearing.

Jehan shoal, the southernmost shoal of the northern group, lies with its southern end $1\frac{1}{10}$ miles in a north-east direction from the Gaham beacon and is the northern limit of El Harig, the fairway. It has no beacon, and its southern edge is not clearly defined, but shoal water extends about 2 cables south-eastward and south-westward from it. From a depth of 5 fathoms at the southern extreme of this shoal, the red beacon of the Middle gateway bears S. 66° E. $7\frac{1}{2}$ cables.

SECOND LINE OF REEFS.—This line consists of a maze of patches extending north and south about one mile inside the outer line of reefs, with channels between the patches. One of these reefs, known as the Fellehiyat, is marked by a red beacon and the Middle gateway, the passage immediately southward of it, is that generally used.

Conspicuous marks.—Houses, forming conspicuous marks have been erected on the following reefs. A small white house, the quarantine hut, about the middle of Bahri reef (not charted); four square white houses on Jezírat Abu Saad, the sandbank, above water, at the southern end of Shab Saad, about 2 miles southward of the gateways; and, similar but smaller houses on

Plan 2599, Jidda and approaches. Var. 2° 10′ W.

the sandbank, above water, at the south-eastern end of Shab Wasta, still farther southward. These should form useful marks for fixing when approaching the gateways.

MIDDLE GATEWAY is that generally used. It is about 1½ cables wide between two parts of the Fellahiyat reef, which show well, and has deep water, but there is a patch of 5½ fathoms, unmarked, in the fairway, below mentioned.

Beacon and buoyage.—Middle beacon stands on the northern side of the gateway, nearly half a cable within the edge of the reef; it is a red iron tripod on which is a red square structure, with a vane at each apex of the roof; it stands on three piles, and is painted red.

Erg el Fellahiya, or Ulysses shoal, is a one-fathom patch, off the reef on south side of the gateway, from which the red beacon bears N. 41° W. 1⅔ cables. It is marked at its north-western edge by a small red buoy, which should be left on the starboard hand in entering, but its being in position cannot be relied on, and in its absence, the shoal cannot always be seen.

A 5½-fathoms patch lies in the fairway about one cable from Middle beacon.

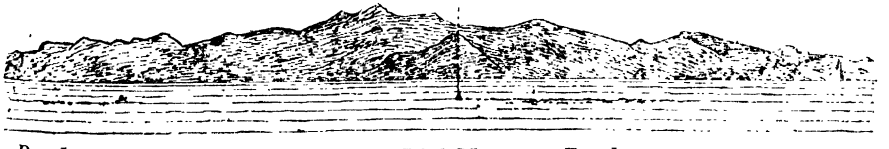
Caution.—Neither beacons nor buoys at the Jidda gateways and anchorages should be depended on, as they are frequently washed away, though with the increasing traffic of late years, probably more care in their preservation is taken than formerly.

Directions for Middle and Inner gateways, &c., *see* page 327.

The South gateway is southward of the Fellahiyat reefs, it is very narrow and is not recommended for strangers, though much used by native craft. The dangers on its southern side are all sunken.

The North gateway is not marked by beacons. It is nearly a cable wide, and deep, and lies on the northern side of the reef which separates it from Middle gateway.

Jebel el Moya on with the southern inner beacon, on Abu Harit, S. 66° E. leads through this pass in about 9 fathoms. *See* sketch .



Breakers. *Jebel Moya.* *Breakers.*

In line with S. Inner Beacon.

General charts 8c and 2523.

Plan 2599, Jidda and approaches. Var. 2° 10′ W.

North entrance.—Directions.—Vessels of moderate draught occasionally use the North entrance to the outer anchorage (page 321); it lies between the reefs Shab Umm el Khalkhalla on the southern side, and Ras el Makhbat on the northern side, and passing in northward of Towila. The least water in this channel is from 4 to 4½ fathoms on the narrow coral ridge which crosses the passage in a north-north-easterly direction from the northern end of the Towila reef. Care must be taken to give Shab Umm el Khalkhalla a good berth, as a 6-feet rock lies about 1½ cables north-westward from it.

THIRD LINE OF REEFS.—This line of reefs is more continuous than the others; it has only one good opening, the Inner gateway, affording an entrance convenient for the harbour. There are other openings available with local knowledge.

Enlarged plan on plan of Jidda and approaches, 2599.

INNER GATEWAY.—Beacons.—This entrance is between Bahri reef on the north and Abu Harit reef on the south, the extremes of both reefs being marked by white stone beacons. The passage is 180 yards wide and quite clear, but neither beacon should be passed too closely, as the reefs are not steep-to; nor, as previously remarked, should the existence of the beacons be absolutely relied on.

Leading mark.—The (second) white house to the right of the town on with Jebel Yemeniya N. 74° E. leads through the centre of the Inner gateway. This mark does not appear on the plan, but the beacons on either side are a better guide.

Erg el Allem.—At 1½ cables inside the Inner gateway and E. by N. ½ N. from the southern beacon, is this coral patch with 1½ fathoms on its shoalest part, near the north-eastern end. The shoal itself is not always visible, and is said to be growing and extending in a northerly direction. There are a number of small shoal heads having over them depths of from 3 feet to 3 fathoms, lying southward of Erg el Allem and eastward of Abu Harit, which are best understood by reference to the plan.

INNER HARBOUR.—Inside the Inner gateway, and between Shabs Burri and Radham on the western side and the shore reef extending from the town on the eastern side, is the Inner harbour, or anchorage, a long narrow space with variable depths and with several patches. With a good light, the shoals and edges can all be seen; but, as much of the anchorage ground is between the depths of 3 and 4 fathoms, the bottom is seen just as clearly at that depth as on dangers, and constant reference to the chart is necessary to discriminate between

Enlarged plan on plan of Jidda and approaches, 2599. Var. 2° 10′ W.

them. On either side the reefs shoal gradually with numerous tongues of coral.

Shab Burri. — At $1\frac{1}{4}$ cables northward of Erg el Allem is Ras el Sunni reef, the southern end of Shab Burri, which shoal, with Shab el Radham, from which it is only separated by a narrow boat channel, forms a reef more than 2 miles long, north and south, and is the immediate protection to the harbour or inner anchorage.

Wreck.—A wreck is charted, in about 15 fathoms, nearly in the fairway, about a cable eastward of the Shab Burri buoy and a little southward of the leading line given. From it, the white stone beacon on Shab Bahri bears S. 8° 4′ W. $4\frac{1}{3}$ cables. This wreck was reported to have masts showing above water in 1908, and to be a good mark. Another wreck with masts showing above water in 1908 is situated about 3 cables to the northward of the above wreck on the eastern side of Burri Shab.

Welled el Ghersh.—Welled el Ghersh is the southernmost danger on the east side of approach to the Inner anchorage, the channel here being about $1\frac{1}{2}$ cables wide. A cluster of patches of from $3\frac{3}{4}$ to $4\frac{3}{4}$ fathoms forms the southwestern extreme of this shoal. The shoal is unmarked.

Gitah el Mayet Seghir.—This patch is awash on the eastern side of the Inner anchorage 4 cables northward of Welled el Ghersh.

About 7 cables northward from Sunni reef, near the southern end of Shab Burri, a tongue of that shoal extends into the Inner anchorage to within $1\frac{1}{4}$ cables of the buoy of Gitah el Mayet Seghir.

There are many other small patches and tongues from the reefs in the anchorage which cannot be well detailed, but will be realised on consulting the plan; they can only be avoided by the eye and lead.

Anchorages.—The best anchorage in the Inner harbour for a vessel of 18 feet draught, is in the northern part, abreast the boat channels to the town. Here the harbour is wider, clearer, has a uniform depth of from 4 to 6 fathoms, sand, and the vessel is in the nearest position to the town, which is about $1\frac{1}{4}$ miles distant. The holding-ground is good. There is, however, a very narrow pass with 5 fathoms in the fairway between banks, with 19 feet water over them, which it is necessary to pass through, and this portion is sometimes crowded with shipping.

General charts 8c and 2523.

Enlarged plan on plan of Jidda and approaches, 2599. Var. 2° 10′ W.

For a larger vessel a good berth is, in from 10 to 13 fathoms, about one cable north-north-westward of Newasta shoal, and westward of Gitah el Meyet Seghir. There is excellent anchorage, in 14 fathoms, southward of Welled el Ghersh, avoiding the wreck shown on chart; here a single anchor is sufficient.

In most other parts of the harbour it is necessary to moor, especially during the pilgrim season when the harbour is crowded, as a vessel at single anchor may entirely bar the passage to the northern part of the harbour.

Boat passage to town.—The boat channel to the town is over reefs and shallows, and, when the water is low, it is difficult to avoid touching; the passage is marked by small stone beacons about 4½ feet high. In 1908 four beacons, in a very dilapidated condition, were reported to be in existence.

Pilots.—As a rule, pilots for the harbour will be found outside, but the firing of a gun will bring them off if they are not in waiting. They are generally fishermen, who know the channels well; they are mostly guided by the eye.

Caution.—Reliance cannot be placed on beacons or buoys in Jidda harbour, as the former are often destroyed and the latter frequently break adrift, and there is much delay in rebuilding and replacing them.

Chart 8c, Red sea, sheet 3.

DIRECTIONS.—General remarks.—On approaching within 30 miles of Jidda, Jebel Haddah or the Saddle hill, 2,650 feet in height, will be seen if the weather is clear, and its summit is not in the clouds; Jebel Yemeniyah (Sugarloaf), 920 feet in height, is more likely to be seen, and when bearing from N.E. to east is conspicuous. The white minarets will be seen about 11 miles distant, or about 3 miles seaward of the outer dangers.

In thick weather, which is common during the summer months, the buildings can only be seen at a short distance, and good astronomical observations are then especially necessary before making the land.

Towards noon is the best time for entering, as, owing to the clearness of the water, the sunken rocks then appear as a dark green shadow on the surface, but when the sun is low to the eastward, and there is much glare, or in thick, hazy, or cloudy weather, the rocks cannot be discovered until close upon them. Much care is required in long vessels entering or leaving the port, as the turnings being sharp, such vessels are much more liable to take the ground than shorter ones.

General charts 8c and 2523.

Plan 2599, Jidda and approaches. Var. 2° 10′ W.

Middle Gateway. — From the southward. — If approaching from the southward, steer in with Jebel Yemenieh bearing N.E. by E. ¾ E., which leads about 1½ miles northward of Musari reef, keeping a good look-out for that reef which usually breaks, and when it bears East one mile distant, steer N.E. ½ E. This leads up to and abreast Gaham beacon, well inside Abu Nakla, and the town will be half a point on the starboard bow when first the course is altered.

If the Musari reef should not be seen, steer for the town bearing about N.E. by E. ½ E.; this leads westward of Musari reef and to a good position for sighting the Gaham beacon, which should be brought to bear half a point on the starboard bow. (The marks for leading inside Rocky bank are given on page 321.) Then run on until Jebel Yemeniya is on with the right extreme of the town N. 71° E.; which being steered for leads to the Middle gateway in not less than 6 fathoms.

Vessels of deep draught will avoid the 6-fathoms shoals northward of Gaham beacon, by steering for Middle gateway, then the beacon bears E. by N.

When the red beacon, on the northern side of the gateway, bears N.E. by N. alter course to pass through the Middle gateway midway between the beacon and the buoy, the passage northward of the 5½-fathoms patch in mid-channel being preferable. Should the buoy be adrift, the vessel should be navigated by the eye, keeping towards the edge of the Middle beacon reef, to avoid Erg el Fallihiyat reef and the patches south-west of it.

Outer anchorage. — When Middle beacon bears West, steer north-eastward to the Outer anchorage if bound there.

Large vessels, and vessels unable to enter the Inner harbour from its overcrowded condition, should anchor between the second and third line of reefs north-eastward of Shab Fellahiyat. Here is protection, but the ground is foul and uneven, the bottom being coral and varying in depth from 6 to 20 fathoms in a distance of a few yards. Numerous anchors have been lost here; but there is no better place at a convenient distance from the town.

Inner gateway. — If bound to the Inner anchorage with Middle beacon bearing West as before, alter course to starboard and steer about E.S.E. for a convenient position for entering the Inner gateway.

When Jebel Yemeniya is in line with the second (?) white house to the right of the town N. 73° E., steer between the white

Plan 2599, Jidda and approaches. Var. 2° 10′ W.

beacons of the Inner gateway and southward of Sunni reef. When the house on Bahri reef bears W.N.W., alter course to the northward, passing between Burri Shab and Welled el Ghersh, and steer up to the anchorage on about a N. by E. ½ E. course. Should the wreck to the eastward of Sunni reef be seen, she will also be a guide for altering course to the northward. The anchorage must be selected by eye. *See* page 325.

A sailing vessel should luff closely round Sunni reef, if it is intended to gain the upper part of the harbour.

From the northward.—If approaching from the northward, keep a good offing until Jebel Yemeniya is between the bearings of E. by S. and E. ¼ N., which will keep a vessel clear of the reefs north and south of those bearings. A good line of approach is with the hill E. ½ S., or the town when in sight, E. by S. Gaham beacon bears S.S.E. ½ E. when the vessel is within the Rocky bank shoals. Steer for Gaham beacon on that bearing until Middle gateway beacon bears northward of East, when the passage may be steered for as before.

Jebel Sannam and Jebel el Moya in line bearing E.S.E. also lead in northward of the Rocky bank, but the course must be altered to the southward when Gaham beacon bears S.S.E. ½ E., as above given.

Other channels.—A sailing vessel may be obliged to take some other passage through the two outer lines of reefs, but the chart and eye must be her guide if she should attempt it without a pilot, and which is inadvisable.

North harbour channel.—There is a circuitous channel into the Inner harbour round the northern end of Shab el Radham, which channel, owing to the crowded state of the harbour, is occasionally used by local craft; but the entrance between Shab el Radham and Shab Hammama is narrow and has a sharp turn of about 8 points.

JIDDA — TOWN. — (*Obs. spot, Lat. 21° 28′ N., Long. 39° 11′ 25″ E.*).—Jidda is the port of Mecca, which latter is distant inland from Jidda about 60 miles in an easterly direction; it is one of the most considerable places on the shore of the Red sea, and is in the province of Hedjaz. The town stands in a low sandy extensive plain fronting a range of hills about 10 miles inland; farther in the interior the land becomes mountainous.

The town, with its white minerets, has an imposing appearance from the sea; it is half a mile square, and enclosed by a wall, with small towers at intervals, the angles towards the

Plan 2599, Jidda and approaches. Var. 2° 10′ W.

sea being commanded by two forts. In the northern fort is the prison; the southern fort consists of two octagons, joined, and in the northern octagon is the flag-staff.

There are three entrances to the town on the sea side, of which the southern is the principal, and leads into the main bazaar. The northern gate is the most convenient for communication with the Consulates, but is seldom opened after dark. There is also a gate on each of the other sides; that on the south is seldom opened; the northern gate is common to all; and the eastern is the Mecca Gate, through which, however, Europeans are at times permitted to pass.

The minarets of three mosques show to seaward, the most conspicuous being the northern and southern ones; the middle minaret, being lower, is half hidden by houses.

Eve's tomb.—On the northern side of the town are several old windmills, and near them a large tomb, said to be that of Eve, about 92 feet long by 22 feet wide. The streets are very narrow and irregular; the houses are mostly constructed of coralline limestone, and some of the newest are large and well built.

The population of Jidda is estimated at about 20,000, of which 15,000 reside within the walls, the rest in the suburbs; of these nearly half are Arabs, about the same number Africans (servants), and the remainder natives of Hindustan. From 40,000 to 60,000 pilgrims are said to pass through annually, but the number varies considerably; in 1897 there was a falling off of 12,000 as compared with the previous year, chiefly due to the plague at Bombay. In 1904, the total number was 66,500, of whom 11,820 were from India. It is to the providing for and conveyance of these travellers that Jidda owes its prosperity as a port, as it has no wharves or convenience for shipping, and is fronted throughout by extremely shallow water, scarcely available for boats during the lowest tides in summer. It is reported to be unsafe for strangers to go more than a mile outside the town.

Communication and trade.—Jidda is a port of considerable trade between Arabia, India, Egypt, and Africa, and many of its merchants are enterprising and wealthy. It is a regular place of call, twice monthly, for the British India Steamship Company's vessels; a French line of steamers, and the vessels of the Austrian Lloyd's touch at irregular intervals. It is also visited by vessels of the Ocean Steamship Company, the Khedivial Mail Steamship Company, three British Indian steamship companies, the Turkish Makhsusi Transport Company, and by those of three Dutch companies.

General charts 8c and 2523.

Plan 2599, Jidda and approaches. Var. 2° 10′ W.

In 1904, the number of vessels of all nationalities entering the Port of Jidda was 1,502, representing an aggregate of 93,191 tons; of this 334,852 tons was that of 236 British vessels, all but one of which were steam-vessels; Turkish vessels, chiefly small local sailing craft, to the number of 1,169, amounted to 52,403 tons. The remainder, 105,936 tons, is accounted for by vessels of nine different nationalities, amongst which the Dutch, Russian, Greek, and Italian flags preponderate, in the order named; the others being quite inconsiderable.

In 1904, the annual value of the exports was 25,128*l.*; they consisted chiefly of hides, skins, gums, mother-of-pearl shell, henna, &c. The imports were valued, in 1897, at 644,989*l.*, a decrease from the previous year of 48,100*l.*, due to the plague at Bombay and famine in India. In 1903 they had increased to 1,405,000*l.*, of which 574,000*l.* was for goods from British India, and 120,000*l.* from the United Kingdom; the greater part of the remainder was from Turkish, Persian, and Egyptian ports, and the rest from all other nationalities. The imports consist chiefly of grain, piece-goods, coffee, tea, sugar, flour, tobacco, spices, timber (a kind of teak), carpets, crockery, and hardware, &c. An ad valorem duty of 8 per cent. is charged on all imports.

Telegraph.—Jidda is in communication by telegraph cable with Suákin, and from thence by Suez or Aden with the general system. It is connected by overland telegraph with the principal Arabian towns, Medina, Mecca, Ephé, Hodeida, Sana, and Mokha; and it is also connected with Perim, by a Turkish cable from Sheikh Syed.

Quarantine.—All arrivals from Indian ports are subject to a quarantine of observation of 10 days, and those from Java to 5 days.

Consul.—Jidda is the residence of a British Consul and Vice-Consul.

Coal and supplies.—No regular stock of coal is maintained, and not more than 150 tons of Welch coal being obtainable at Jidda can be relied on. The coal is put on board vessels lying either at the inner or outer anchorage, by boats, but the operation is often impeded by strong winds, and still more so by low tides, when the extreme shallowness of the water makes it impossible for coal boats to pass to and fro for two or three days together. Beef, mutton, and fish are plentiful, also fresh bread, but fruit and vegetables are scarce.

Water.—The water supply is of poor quality and very expensive, about 15*s.* per ton (1903). The surplus of water from

Plan 2599, Jidda and approaches.

the condensing apparatus is sold at about 18*s.* per ton, and the total produce by this means is only about 15 tons per diem. The average annual rainfall is limited to a few showers which fall chiefly in December and January, when the cisterns and reservoirs owned by private individuals become filled and form their store for the year.* Mecca is fairly well supplied with water; Medina has an abundance.

Winds and Weather.—At Jidda, during January 1896, H.M.S. *Melita* found the weather usually fine and dry, with very few clouds or a little haze when a northerly wind prevailed, but always cloudy and damp with southerly and easterly winds; the wind was generally from north-north-east in the early morning to north-west at night, force one to 5. The natives say that when the wind remains due north during the night a strong north wind may be expected the next day; and, when the wind inclines to the eastward in the early morning, it will be light and the weather fine.

In December, the prevailing wind was northerly, from north-north-east to north-west, force 0 to 4; with an occasional southerly wind, between south-west and south-east, force one to 5, lasting three days at a time. Winds from east and west were rare and light. Rain fell on two days with a south-west wind.

See also Meteorological table, page 560.

* The rainfall differs considerably in quantity in different years. The rainfall during November 1895 was the heaviest known to the inhabitants, many of the houses being rendered unsafe by it.

General charts 8c and 2523.

CHAPTER VII.

EAST COAST OF RED SEA FROM JIDDA TO KAMARAN BAY.

(Lat. 21° 20′ N., Long. 39° 15′ E., to Lat. 15° 10′ N., Long. 42° 50′ E.)

VARIATION IN 1909.—Decreasing 4′ annually.

Charts 8c and 8d, Red sea, sheets 3 and 4. Var. 2° W.

COAST.—General remarks.—From Jidda to Ras el Bayadh (*Lat. 15° 15′ N., Long. 42° 35′ E.*), the coast is bordered by reefs and banks, which, from abreast of Lith, extend far towards the centre of the sea. The extensive Farisan bank is upwards of 320 miles long, has nearly the same direction as the coast off which it lies, and forms the principal boundary of the Inner channel southward of Lith, page 338. Like the Dahalak bank, on the opposite side of the Red sea, the Farisan bank is so encumbered with shallow reefs imperfectly charted that it is dangerous to cross throughout the greater part of its length.

From Ras al Aswad, the southern horn of the bay of Jidda, to Lith, the coast-line has a general south-easterly trend for upwards of 100 miles; it is low, and, as before stated, fringed throughout the whole distance by a reef, in some places extending more than a mile from the shore. Within this length of coast are numerous detached outlying reefs from 8 to 17 miles from the shore, described in the following pages.

There were no towns in 1834 on this part of the coast nor any supplies obtainable. Probably there are inhabitants at the better anchorages hereafter mentioned.

Landmarks.—Between Jidda and Lith some of the high land in the interior is conspicuous.

Jebel Abu Shauk (*Lat. 20° 55′ N., Long. 39° 28′ E.*), 10 miles inland, is a small two-knobbed hill.

Jebel Sádiyah is a remarkable peak on the highest part of the land in the distant range north-eastward of Mahram; a little eastward of it is a still more remarkable peak by which it may be known.

General chart 2523.

Charts 8c, Red sea, sheet 3. Var. 2° W.

Sugarloaf is a peaked mountain, its top forming three small peaks 18 miles north-north-eastward from Mersa Kishran; it is in line with Jebel Sádiyah and Tower hill on a north-north-easterly bearing.

Tower hill.—The range of hills from the northward converges towards the shore between Mahram and Kishran, and Tower hill is a little inside the extreme of the range as seen from Mahram; it is a remarkable piece of broken land, not unlike a tower; but off and south-eastward of Kishran, it shows as a double rugged top and appears much larger in this latter direction; the piece of land outside it shows as two round hills.

Two peaks are situated south-eastward of Tower hill; at Mahram, these appear as the two highest peaks on two sloping mountains, like wedges; both peaks are double. A third peak lies between these peaks and Tower hill.

Ras al Aswad (*Lat. 21° 20′ N., Long. 39° 8′ E.*), the southern extreme of the bay of Jidda, is a low sharp point, bordered by reef. South-westward 1½ miles from it, and on the shore reef, is a little island named Ghorab.

Someima is 7½ miles southward of Ras al Aswad. This anchorage, in 9 fathoms, mud, is in a bight in the coast reef and is open to the north-west, but affords tolerable shelter from southerly winds. When at anchor, Jebel Sannam peak should be little open northward of Jebel Haddah saddle.

Reefs.—Irk-el-Ghorab is a breaking reef with no bottom at 120 fathoms close westward of it. It bears S.W. by W. 8¾ miles from Ras al Aswad, and S. ¾ W. 4¼ miles from the Musari reef.

Kobbein (*Lat. 21° 12′ N., Long. 39° 1′ E.*), Alkasr Shamiya, and Alkasr al Yemaniya, are breaking reefs from 5 to 9 miles off-shore, and are all on the same bank, which is about 11 miles long in a south-by-east direction and about 9 miles wide. There is a deep-water channel between the bank and the shore reef; and, generally, from 10 to 25 fathoms on the bank between the clusters of reefs. Kobbein is the northernmost of the group.

Katat Teffa and **Katah Kidan** are two reefs, separated from each other by a deep channel 2 miles wide. Katat Teffa is 3½ miles from the coast reef, and 2 miles south-eastward from it is a rocky patch 3½ miles off shore.

Reported shoal.—At about 2½ miles south-westward of it, and not more than a mile north-westward from Katah Kidan, is

Chart 8c, Red sea, sheet 3. Var. 2° W.

a small patch with an estimated depth of 3 fathoms, reported by the s.s. *Mozaffari* in 1906, probably identical with one of those charted. These reefs have deep water around them.

Kidan is 22 miles southward of Someima. There is anchorage off it, in 4 fathoms, with tolerable shelter from westerly winds, in a bight of the coast reef, but it is open to the southward.

Abu Shauk (*Lat. 20° 52′ N., Long. 39° 18′ E.*) is 25 miles southward of Someima. This place has excellent anchorage for small craft in 6 fathoms, but the entrance is very narrow between the reefs off it. Jebel Abu Shauk, before described, bears from it E. by N.

Abu Shuak reefs lie 5 miles south-south-west from Abu Shuak. This is the most northerly of a group of reefs extending 13 miles in a south-south-easterly direction, of which Towil Raghwan reef is the most southerly. Between the reefs in this space are deep-water channels, but the shoals may be considered as forming a connected line which vessels ought not to attempt to pass through. There is deep water close to their western side.

Kuff is a small bight in the coast reef about 5 miles south-eastward from Abu Shauk; there is anchorage, in 11 fathoms, rocky bottom, but no shelter is afforded.

Katah Abu Duda is a patch of rocks bearing W. by N. 3 miles from the inlet Abu Duda. Deep water lies between it and the shore reef. Of the capabilities of the inlet there is no information.

Mahram (*Lat. 20° 25′ N., Long. 39° 40′ E.*) is the next available anchorage near the shore southward of Kuff, but it is not good, there being straggling rocks in it. A vessel wishing to stop here had better anchor outside the rocks off it.

Mirkat is nearly 8 miles south-eastward of Mahram; its position may be recognised from seaward by a conspicuous tomb on a hill. The anchorage, in 15 to 16 fathoms, is just southward of the shoals off it, which afford some little shelter from westerly winds.

Shejah reef lies S.W. by W. 5 miles from Mahram; the Inner channel is between them. The Shejah reef consists of two parallel reefs, each about $1\frac{3}{4}$ miles long north-east and south-west, and separated from each other by an 8-fathoms channel about half a mile wide. A reef lies $2\frac{1}{4}$ miles north-westward from Shejah, and between the two is a channel with about

Chart 8c, Red sea, sheet 3. Var. 2° W.

14 fathoms water. A reef also lies W. by N. about 5 miles from Shejah, discovered by H.M.S. *Philomel* in 1881. Another reef, about 2 miles long, lies 2½ miles in an east-south-east direction from Shejah, with deep water channel between.

Kad Homeis (*North-western part, Lat. 20° 15′ N., Long. 39° 25′ E.*) is a series of low sandy islets on two reefs together about 2½ miles in extent north-west and south-east, and 16 miles from the nearest point on the mainland. The whole reef is surrounded by deep water.

Current.—In April 1862, H.M.S. *Hornet* experienced a westerly set of 1½ miles an hour in the vicinity of Kad Homeis.

Reefs.—About 17 miles eastward from Kad Homeis and 6 miles from the nearest land, is a small detached reef, steep-to, and, E. by S. ½ S. 22 miles from Kad Homies, are two reefs which break at times; the southern reef has a sand cay, and is nearly 8 miles from the nearest land.

Caution.—These reefs lie in the approach to the Inner channel from Lith southward and others may exist. Navigation should be conducted from aloft.

JEZÍRAT KISHRÁN (*West end, Lat. 20° 15′ N., Long. 39° 56′ E.*) is about 14 miles long in an east-south-easterly direction, with the small island Tahara at its eastern end; it fronts a large bight in the coast, leaving but a small opening at either end.

Mersa Kishran.—This anchorage, at the western entrance to the bight or lagoon behind Jezírat Kishrán, has a rocky bar at its entrance with 2¾ fathoms water on it; the bar appears to connect the coast reef off Kishrán with a shoal eastward of it, by which the anchorage is protected; the depths are 5 or 6 fathoms, muddy bottom. In a south-westerly wind, a heavy swell rolls into this place and the surf breaks on the bar. Tower hill bears N. by E. ¼ E. from the entrance.

Sumar island, at the western end of Shab el Jeffin and about a mile from the shore of Jezírat Kishrán, is eastward of the shoal which shelters the Kishrán anchorage, and the bight between that shoal and the island, called the Sumar anchorage, is preferable to Kishrán anchorage; the depth in Sumar anchorage is about 6 fathoms, mud.

Shab el Jeffin.—From the island of Sumar, this shoal extends eastwards beyond the centre of Jezírat Kishrán, nearly parallel with that island, for about 9 miles, leaving a narrow 2-fathoms channel between it and the island reef. At the

Chart 8c, Red sea, sheet 3. Var. 2° W.

western end of Shab el Jeffin, its outer edge is only a mile distant from the shore; at its eastern end it is rather more than 2 miles. Under shelter of its eastern end, and about a mile from the shore of Jezírat Kishrán, a vessel may anchor, in muddy bottom, just southward of the discoloured water.

Northern Approach to Lith.—Kad Homeis islets and the shoals eastward of them, in the approach to Lith, are mentioned on page 335. There should be no great difficulty in approaching Lith from the northward if Kad Homeis is made the departure, more especially as the southern reef between it and Katat el Gursh is above water. The land is often hidden by haze, so that a good look-out aloft is necessary.

Commander Wharton, H.M.S. *Fawn*, remarked in 1877, that the positions of the reefs westward of Abulat island are doubtful; the currents also are strong and uncertain in direction, and the water too deep for anchorage; much caution is, therefore, necessary when navigating in this locality.

Katat el Gursh, or Midchannel reef, in the fairway of the northern channel to Lith, is about 3½ miles long, north-west and south-east; the north-western part is nearly 2 miles southward of the eastern end of Shab el Jeffin, and for a distance of 4 cables, is awash; the remainder has 12 feet water over it.

Two remarkable peaks in line N. by E. ¾ E. lead north-westward of the reef. These probably are the peaks referred to on page 333 as eastward of Tower hill.

Abulat cone, close to the western side of Abulat island and very conspicuous, bearing S. by E. ¾ E. leads westward.

Abulat island (*Cone, Lat. 19° 58′ N., Long. 40° 6′ E.*) is the northernmost island on the Farisan bank, and is about 3 miles within the edge of that part of the bank abreast of it. Abulat is on the western side of the Inner channel and is 2½ miles long, north-west and south-east, three quarters of a mile wide, from 250 to 300 feet high, and surrounded by a sandy plain. It is quite barren and destitute of water; branches of coral are observable protruding from its highest parts. Abulat cone, a high and very conspicuous rock, lies close to the western side of the island. Here there is also a small port fit for fishing-boats; and, beyond it to the westward, breaking reefs as far as can be seen from the top of the island; also, several rocky patches near the edge of the bank northward of the island.

Reefs.—About 5 miles N.W. by N. from the north-western end of Abulat is Katat el Jebel, a breaking reef, and the

Chart 8c, Red sea, sheet 3.

northernmost on the Farisan bank; there are depths of 22 fathoms close to its northern side, and the channel between it and Katat el Gursh is 3 miles wide. The positions of the reefs westward of Abulat island are doubtful.

Shab Jenab lies 10 miles south-westward of Jebel, and is the outermost reef on the bank. The dangers on western end of Farisan bank are described on pages 375 and 379.

Plan of Lith on chart 8c.

LITH (*Obs. spot, Lat. 20° 9′ 8″ N., Long. 40° 14′ 20″ E.*).—The town of Lith is small and consists of a number of mud houses about 1½ miles inland. It is governed by an Arab Sheriffe subject to the Pacha of Jidda. From the latter place to Lith, the journey occupies three days by land. The plan shows a blockhouse, barracks and a mosque abreast the anchorage. The coast in this vicinity is low, sandy, fronted by coral, and covered in some parts by bush, but inland and to the northward the ranges of mountains, of which Tower hill and Jebel Sádiyah form part, present a remarkable appearance.

Water may be obtained at Lith as well as a few sheep and fowls. An Austrian Lloyd's steamer calls here at about tri-monthly intervals on her passage from Loheiya and Kunfida.

Agha islet, westward of Lith inner anchorage, is small, low, and sandy, and has on it several houses. The position of Rátha, about 3 miles southward of Lith, is well defined by two conspicuous isolated trees.

Lith Inner anchorage is small, but well protected by the reef which extends nearly half a mile off the Mosque, and the two reefs eastward of it. The best entrance is apparently that close eastward of the Mosque reef; the depths are from 4 to 6 fathoms, mud. In leaving this place in a sailing-vessel and having to go eastward of the reefs mentioned, the reefs should be kept close aboard.

Lith Outer anchorage.—The best anchorage in the outer road is from a half to one mile south-south-westward of Agha islet, in from 10 to 14 fathoms, mud, but there is no shelter here from northerly or north-westerly winds. About 1½ miles south-westward of Lith is an extensive reef of innumerable patches, with a channel on either side of it.

Local pilots state that S.W. by S. 4 miles from Lith is the tail of an extensive shoal connected by foul ground with the shoal marked as lying south-south-west of Lith. The latter shoal is said to extend some 2 miles farther westward than was formerly supposed; to clear it, a vessel leaving Lith anchorage should steer W. by S. until Tower hill bears N.N.W. ¼ W. The whole information is extremely vague, necessitating a good look-out from aloft as in all places on this coast.

General chart 2523.

Charts 8c and 8d, Red sea, sheets 3 and 4. Var. 2° W.

INNER CHANNEL.—Lith to Kamaran.—General remarks and directions.—The Inner channel from Lith southward, lies between the reefs bordering the coast and the eastern edge of Farisan bank. It varies from 3 to 7 miles in breadth and is obstructed by many reefs and islets, with deep water between, and for about 40 miles is very intricate; but, after passing Surrein, it is clearer and there are many good anchorages but also many sunken patches in the channel. A little northward of Khor El Birk, the channel is contracted to a width of from one to 2 miles by the bank Umm Kerkan, the northern part of which, in lat. 18° 24½′ N., is very shoal, but there are 2 and 3 fathoms on other parts. After passing this extensive bank, the Inner channel becomes comparatively open. There are several breaks in the shore reefs, some of them affording secure anchorages.

The following remarks are condensed from the original directions given by Captain Elwon, who partly surveyed this channel in 1834. It must be borne in mind, that the chart is a very poor one, that the objects for fixing are few and far between, and that to safely navigate this channel the pilot must spend his time aloft. The information on the depths must be gathered from the chart. The pecked line on the chart is marked from the report of the original surveyors, but the mariner must use his judgment in following it. Apparently one of the smaller vessels of the Austrian Lloyd's use this channel; *see* Lith. *See* also remarks on the Inner channels at page 34.

Should it become necessary to pass from the central track in the Red Sea to the Inner channel, it is requisite to make certain of the vessel's position, so as to be at a moderate distance from the reefs at dawn, in order to have as much daylight as possible to run across with; and a sharp look-out must be kept for sunken patches, some of which can only be seen in clear weather and when the sun is in the opposite direction to the vessel's course. (This is not recommended without some special object in view.)

Conspicuous mountains.—Between Lith and Kunfida are some noticeable mountains, viz.:—

Jebel Shakah (*Lat. 19° 59′ N., Long. 40° 58′ E.*), a remarkable piece of land on the second range north-westward of Jebel Dauka.

Jebel Dauka, also most remarkable, is on the highest range of mountains northward of Kunfida. In that direction, it runs off to a peak, but its northern extreme more resembles a wedge, the thickest part of which is to the northward.

General chart 2523.

Chart 8c, Red sea, sheet 3. Var 2° W.

Kauz Abu-l-Ayir is the highest range of mountains eastward of Kunfida; its northern brow appears as a high mound until well to the southward, when it becomes rugged; its southern brow has a small but conspicuous peak. This mountain is not shown on the charts, but may be seen from northward of Ras el Askar.

Raka lies 13 miles south-eastward from Lith roads. For the first part of this distance, the width of the coast reef is about 5 cables, with some patches off it, and from 6 to 10 fathoms a short distance from the shore reef; but for more than the latter half of the distance to Raka the coast reef extends upwards of 2 miles off-shore A vessel bound for Raka, from the fairway south-east of Katat el Gursh, should take care not to get into less than 14 fathoms, to avoid the extensive patches off the shore reef; and, when southward of these, a course about East for 5 or 6 miles will carry her to the entrance of Raka, but the soundings are very irregular, from 12 to 5 fathoms, rocky bottom.

Anchorage.—Raka may be known by the high sand-hills close to the beach eastward of it; the bay is much encumbered with coral patches and only fit for small craft as an anchorage; it provides however, good shelter for dhows at all seasons in a bight of the coast reef, and is much used by them.

The reef here extends nearly 2 miles from the shore, and there are some rocky patches off the entrance; also the extensive shoal, Shab el Mudharr, in patches, bearing from south by east to south-west from the anchorage, and nearly a mile from the coast reef; there are other patches southward and south-eastward of it.

Between Raka and Jelájil, the coast is low, sandy, and forms a bight bordered with coral reef in which are several 3 and 4 fathoms patches with 20 and 24 fathoms between them.

Plan of Jelájil on chart 8c.

Jelájil (*Lat. 19° 55½′ N., Long. 40° 30′ E.*) has good anchorage, in 8 or 9 fathoms, mud. Entering from the north-west after passing Shab el Mudharr, before mentioned, steer for the point of the reef off the entrance, and leave on the port hand all the sunken patches visible. At this place there is (1834) neither house nor hut, but about 3 miles farther southward is the coastal village Shakah.

General chart 2523.

Plan of Ras el Askar, sheet 14. Var. 2° W.

Ras el Askar lies 5 miles south-eastward of Jelájil; it may be known by the trees on it, there being no others on the shore near it.

Rocky bank.—At 1½ miles south-south-east from Jelájil is the northern extreme of a cluster of rocks on a bank about 5 miles long and 2 miles wide, with a channel on each side. The patches are very numerous, have deep water between them, and, on some of them, are 2, 3, and 4 fathoms.

Channels.—The passage eastward of the Rocky bank was formerly considered the safest, as the shoals could be better seen than in the western channel, but it is not now recommended, having been found so much narrower than as charted, as to be scarcely safe or practicable for vessels of any size. The western channel was almost always used by sailing vessels with westerly winds, and would appear to be the best and safest under all circumstances for steam-vessels.

In either channel, a good look-out is required; and, in coming from the southward, the extensive reef in patches on the bank that separates the channels will be seen, as well as the sandbank on the southern part of it; these are a good guide in judging the distance of a vessel from the patches forming the western side of the western passage, on which the least water found was 2 fathoms.

Charts 8c, Red sea, sheet 3.

Jinnabiyat island (*Lat. 19° 47′ N., Long. 40° 33′ E.*) is on the eastern edge of the Farisan bank, western side of the channel; it is nearly 4 miles distant from Ras el Askar on the opposite side. The island is over 2 miles long, north-west and south-east, narrow, and surrounded by a reef. A similar island, about a mile long and also surrounded by a reef, lies eastward of Jinnabiyat; both are low and bushy. The channel between the two islands is only used by small native vessels. Off the north-eastern side of the latter island are two small islets encircled by reefs.

Islets.—In a south-easterly direction and 2½ miles distant from the eastern end of Jinnabiyat is a small islet surrounded by a shoal, having deep water on its south-western side; there is a shoal patch about a mile westward of this islet which is the southernmost islet of a group of four, very similar in appearance, and extending in a south-easterly direction from the eastern end of Jinnabiyat; they are surrounded by reefs, and the numerous shoals in this part almost block the channels

Chart 8c, Red sea, sheet 3. Var. 2° W.

about 3 miles north-westward of Ras el Humar; there are, however, deep channels between some of them.

From Jinnabiyat to Surrein island, the eastern edge of the Farisan bank is studded with rocks and shoal patches.

Ras el Humar and Ras Mahasin.—Ras el Humar is 8 miles south-eastward of Ras el Askar, the coast between the two being fringed by a reef; it is a tongue of land extending in a southerly direction from the mainland; Ras Mahasin, 7¾ miles farther south-eastward, projects towards Ras el Humar in a north-westerly direction, the two points enclosing between them a bay of considerable size, bordered throughout by reef. In the mouth of this bay, and in line between the points, is an island nearly 3 miles long, north and south; it has reefs and patches, with channels between them, extending from its northern end to Ras el Humar, the northern point of the bay. There are also reefs and patches on the eastern side of the island in the bay; off its western side are numerous reefs and rocky patches, with deep water between, extending across the channel to Surrein island, about 5 miles distant. Off its southern end, and a mile westward of Ras Mahasin, is another shoal.

Surrein island (*Eastern end, Lat. 19° 37′ N., Long. 40° 38′ E.*).—This island, known to the natives as Jebel Dauka, lies with its south-eastern end distant 7 miles westward from Ras Mahasin on the opposite side of the channel; it is high with an irregular top, is about 7 miles long and one mile wide and surrounded by a broad coral reef, and there are some patches on the south-eastern part, which form the western side of the channel. The island consists of coral and sand, and, there being neither water nor wood, is not inhabited. There are some patches south-eastward of it on the edge of the Farisan bank, which here bends to the southward, the reefs at its edge joining the Kefil islands.

Channel.—There are 19 fathoms close north-eastward of the eastern extreme of Surrein, and, E. by N. from the same point is a patch close to the reef on which Surrein stands; the best channel is between this patch and another a mile distant to the north-east.

Kefil islands, low and sandy with few bushes, about 7 miles south-eastward of Surrein, are nearly joined to the eastern end of that island by shoal patches, which, like the Kefil islands, are on the edge of Farisan bank.

Fara islands (*South-extreme, Lat. 19° 17′ N., Long. 40° 53′ E.*), also on the eastern edge of the Farisan bank,

Chart 8c, Red sea, sheet 3. Var. 2° W.

adjoin the Kefil islands, and are of a very similar description; immediately southward of them is the entrance to a channel across the Farisan bank used by native bágalas.

On the eastern side of the channel, 2½ miles southward of Ras Mahasin, is a small island with reefs extending a mile westward of it. At 5 miles southward of the Ras, are two small islets having a reef 5 cables to the northward, and a depth of 12 fathoms south-westward of them; the two islets are 2 miles south-westward from Ras Zugheib, the nearest point on the mainland. The channel lies westward of these islets.

Dauka anchorage.—Dauka is 8 miles south-eastward of Ras Mahasin, and has good anchorage in 5 fathoms eastward of a small patch which shelters the roadstead. There are a few huts, and the inhabitants are civil; no fresh water can be obtained.

Reefs.—Two reefs with some small islands on them lie westward and southward of Dauka, extending in a south-south-easterly direction about 5 miles; they are from one to 2 miles off-shore, with 6 and 7 fathoms water between them and the coast reef. Some patches lie north-north-westward of them, and, from these, others with from 6 to 8 fathoms between them extend westward to near mid-channel, where are the two small islets already mentioned as lying 5 miles southward of Ras Mahasin.

The navigable channel lies westward of all these reefs, and is about 2 miles wide at this part, having from 9 to 12 fathoms water in it.

Ras Matwiya (*Lat. 19° 21′ N., Long. 40° 58′ E.*), is 21 miles south-eastward of Ras Mahasin. About 1½ miles west-south-west from Ras Matwiya is the northern end of a reef with two small islands on it, which extends from thence south-south-east 2¼ miles. Northward of the Ras, the coast reef extends 2 miles off-shore and is steep-to. Between this and the reef last-mentioned is a channel a mile wide, with 5 and 6 fathoms water; the channel westward of the reef, between it and the Fara islands, is the main channel and is 4 miles wide, with a depth of 12 fathoms.

There are two small islets surrounded by reefs, lying S. by W. ½ W. 5½ miles from Ras Matwiya. The north-eastern islet has a small patch off its south-eastern side, 5 cables distant. The best channel lies westward of these islets, which are 3½ miles distant from the southernmost of the Fara group.

Between Ras Matwiya and Kunfida, are several rocky patches and low islands from one to 2 miles distant from the shore.

Plan of Kunfida on chart 8c.

Kunfida (*Lat. 19° 8′ N., Long. 41° 3′ E.*) is a small walled town with a Turkish garrison; on its southern side, without the walls, is a mosque and minaret.

Supplies.—Kunfida has a small bazaar with supplies sufficient for the place only; but, by giving notice and waiting a few days, a vessel may obtain cattle and sheep, as well as vegetables, from the interior (1881). The best water on the coast is to be had here; it is brought down in mussucks (skins) on camels, alongside the boats, and the casks filled. Much grain is grown in this district. In July and August, good grapes may be obtained.

Communication.—The only steam-vessels visiting Kunfida are those of the Austrian Lloyd's Company; they call at intervals of three months on their voyage from Loheiya to Lith.

Anchorage.—The southern side of the anchorage is protected by a reef about a mile in length on which is a low bushy island easily seen. A small shoal lies between the island reef and the northern point of Kunfida bay, and the best channel to the anchorage is between it and the island reef, where there is a width of 4½ cables and a depth of 7 fathoms. Eastward of the island is a narrow channel of 4 and 5 fathoms, fit only for boats or for those having local knowledge; it is between the island reef and a rocky spit projecting from the shore reef southward of the town.

There is also a 2-fathoms channel northward of the small shoal in the entrance, but it is rocky and not recommended.

The anchorage is westward of the town, from 5 to 8 cables from the shore, in about 5 fathoms.

Shoals.—From one to 3 miles westward of Kunfida are several rocky patches.

Chart 8c, Red sea, sheet 3.

Coast.—From Kunfida to Makásir, the shore is fringed by reef, and there are several outlying patches and low islands in places as much as 1½ miles from the shore, with from 6 to 12 fathoms between them and the coast reef.

Umm-s-Saifa is a small low sandy island, covered with bushes, 5 miles south-south-westward from the town of Kunfida. A rocky patch lies 2 miles north-eastward of this island.

UMM-UL-KOMARI islands are also small, low, sandy, and covered with bushes; the western island lies 3½ miles in a west-north-westerly direction from Makásir point. Nearly in the same direction, from 5½ to 7 miles from the same point, are

Chart 8c, Red sea, sheet 3. Var. 2° W.

two shoal patches, the westernmost being only a mile from the edge of Farisan bank on the western side of the channel. Nearly 2 miles south-eastward from the western island is the outermost of three shoal patches lying in the same line. Foul ground extends about 7 or 8 cables north-eastward from the eastern island, and at 1½ miles north-eastward of that island is a shoal bank about 8 cables long, east and west; it lies near the track recommended. All these patches are easily seen.

Channel.—The best channel is between the islands and the mainland; or a vessel may pass between the islands, avoiding the rocky shoals southward of them and a rocky patch off the northernmost one.

Anchorage.—There is anchorage all round the Umm-ul-Komari islands.

Makásir anchorage (*Lat. 18° 58′ N., Long. 41° 7′ E.*). —Makásir is 11 miles southward of Kunfida roads, and has good protection from southerly winds in a small bay northward of the point, but there are some small patches in the entrance to the anchorage.

Andah anchorage is between the coast reef and Andah shoal, which is 3 miles long, north and south. On the southern part of the shoal are some shallow patches; its northern extreme is 1½ miles southward of Ras Abu Matna.

The depth in the anchorage is from 2½ to 7 fathoms, as little as 15 feet having been found in the northern part of the anchorage ground, the northern channel. The safest channel, in or out, for vessels of light draught, is northward of the reef; if going out through the southern entrance, run 3 or 4 miles to the southward of the anchorage before hauling to the westward, in order to clear the dry reefs, south-westward of Andah shoal.

Dry reefs.—At 3 or 4 miles south-westward of Andah shoal are three dry reefs; there are passages between each, and also between them and Andah shoal

Serom, 4 miles southward of Andah, is a small place where there is an anchorage for boats.

Charts 8c and 8d, Red sea, sheets 3 and 4.

Ras Abu Kalb (*Lat. 18° 41½′ N., Long. 41° 12′ E.*), is 9 miles southward of Andah. The coast reef is continuous between the two places and at this point stretches off about a mile to seaward.

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 2° W.

Reefs.—Abreast of Ras Abu Kalb and nearly in mid-channel are two reefs in broken ridges dry in places; the northern reef is 2 miles long on a north-north-east line of direction; the southern reef is 1½ miles long, north and south. These reefs may be passed on either side, but, if passing westward of them, a good look-out must be kept for a patch which lies W. by N. 6½ miles from Ràs Abu Kalb.

Dubareh is a small low sandy island, 4 miles within the line of reefs marking the western edge of the Inner channel and 5 miles north-north-westward of the Firandiya islands.

Firandiya islands (*Lat. 18° 41′ N., Long. 41° 1′ E.*), also on the western side of the channel, but near the edge of the bank are two small oblong table-topped black rocks, about 40 feet high.

From these islands southward, the eastern edge of the Farisan bank is not so clearly and sharply defined as it is the whole distance northward of them.

Jebel Sabaya island is 4 miles southward of the Firandiya islands, is entirely surrounded by a fringing reef extending from 2½ to 5 cables from the shore, and is about 2 miles square and 60 feet high, sloping a little at the top towards its rugged sides. On the western side of the island are a few fishermen's huts, and on the eastern side is a village where water, poultry, and goats may be obtained; communication is effected by a boat channel through the fringing reef.

Jezírat Kutna.—The northern point of this low coral island is 2 miles southward of the nearest part of Jebel Sabaya; the island is about 5 miles long by 2 miles wide, with a growth of bushes on it, and is surrounded by a reef extending nearly 3 miles to the south-eastward on which are some large rocks or small islets. The depths close eastward of the island are from 30 to 40 fathoms, mud, decreasing gradually towards the main land shore. The other sides have somewhat deeper water.

Hali point (*Lat. 18° 35′ N., Long. 41° 16′ E.*), lies 8 miles southward of Ras Abu Kalb on the eastern shore. The coast reef midway between these two points extends about a mile off shore, and has a depth of 4 fathoms close to it. Hali point is bordered by an extensive reef, and some shoal patches extend in a westerly and south-westerly direction outside the reef. No houses are visible, but a town or village is said to be not far inland.

Anchorage.—Good anchorage in from 5 to 7 fathoms may be found in the bay of which Hali point is the western

Chart 8d, Red sea, sheet 4. Var. 2° W.

extreme, well sheltered from northerly and easterly winds, the shore being fringed by reef. On the eastern side of this bay is a place called Bu-Jama, where, however, neither house nor hut were seen.

COAST.—Aspect.—Jebel Hali (*Lat. 18° 45′ N., Long. 41° 38′ E.*), is a mountain in the nearest range of hills, south-eastward of Kunfida 22 miles north-eastward of the point of same name; it is a very remarkable pyramidal piece of land when seen from that place or northward of it, but, in proceeding southward, it quickly alters, and, at Andah, appears as an oblong hill, with its northern part rounded off abruptly.

From Hali point to Khor Nohud, 22 miles distant, the coast line has a general south-south-east trend, but in the interval are several bays in which anchorage may be obtained. In the neighbourhood of Khor Nohud and Khor El Birk, the range of hills converges towards the coast, the tops resembling the roof of a barn. Amongst these are two, larger than the rest, called by the natives Jebel Túsi Sham and Jebel Túsi Yemeni, or the woman's breasts. From Khor El Birk, they appear in the northernmost part of the range of hills, and may then be better known by a detached piece of land to the southward, showing more like a barn than either of them. Shifting peak is in the second highest range of mountains westward of Napud hills, and is very conspicuous when seen from the northward.

From Hali point to Umek the shore is fringed by reef and is much indented, but from Umek to Nohud the coast-line is nearly straight and there is no coast reef.

Jahfúf bay, about 7 miles south-eastward from Hali point, affords good shelter from northerly and easterly winds, the depths being from 5 to 8 fathoms. There is neither house nor hut at this place.

Khor Umek (*Lat. 18° 29′ N., Long. 41° 22′ E.*) is 10 miles south-eastward of Hali point, and is an inlet between two prongs of the coast reef extending to the southward. Neither houses nor huts can be seen, nor can fresh water be procured. The anchorage in the khor is in from 6 to 8 fathoms, but the available space is small.

Between Khor Umek and Khor Nohud, 12½ miles farther southward, there is, as has been stated, no coast reef until in the immediate vicinity of the latter khor.

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 2° W.

Hadara islands and bank—These islands are on a crescent-shaped rocky bank about 7 miles long, the northern extreme being nearly 10 miles west-south-westward of Khor Umek, and its south-eastern extreme nearly 4 miles westward of Umm Kerkan. The islands are low, sandy, and covered with bushes. About a mile eastward from the eastern end of the Hadara islands is a one-fathom patch.

Kad Hadara (*Lat. 18° 27′ N., Long. 41° 14′ E.*), off the northern end of the Hadara bank, is a low sandy island on a reef lying north-west and south-east. Nearly 3 miles eastward of Kad Hadara is a similar island on a reef extending a short distance north-westward from it. At half a mile south-westward from this island is a patch with from one to 3 fathoms.

Al Gherif is a large rocky bank, upwards of 8 miles long, north and south, by 4 miles wide, with many shallow patches; it lies 5 or 6 miles south-westward of the Hadara bank.

Umm Kerkan is a bank lying parallel with the shore between Khors Umek and Nohud, forming the western side of the Inner channel, which is here little more than a mile wide. The northern end of this rocky bank is 3 miles southward of Umek; from thence it extends 6 miles southward, and is from 1½ to 2 miles wide. Its northern part is rocky, shallow, and uneven; on the southern part the water is deeper.

The mid-channel depth between this bank and the shore is about 20 fathoms, but there is a 2-fathoms patch 1½ miles northward of Umm Kerkan, and 1¾ miles from the shore, which may be passed on either side, also two shallow patches between it and the shore abreast of the northern end of the shoal, which must be carefully avoided.

About 4½ miles in a west-north-westerly direction from the northern end of Umm Kerkan is a 2-fathoms shoal, westward of which are the Hadara islands and other shoals, as presently described.

Plan on chart 8d, Khor Nohud.

Khor Nohud (*Lat. 18° 16′ N., Long. 41° 27′ E.*) is a good inlet in which anchorage may be obtained in about 7 fathoms. The coast near it is low, sandy, and fronted by coral. Abreast of Khor Nohud, the Inner channel is 1½ miles wide between the coast reef and the bank extending eastward from Jezírat Marka.

Chart 8d, Red sea, sheet 4.

Jezírat Marka (*Lat. 18° 13½′ N., Long. 41° 19′ E.*) is a low sandy island surrounded by a reef which is connected with an extensive bank of rocks and sand forming the western side of the Inner channel. About 10½ miles south-south-eastward from Marka is a rocky patch on the southern end of this

Chart 8d, Red sea, sheet 4. Var. 2° W.

bank. From the rocky patch, the eastern edge of the bank extends about 12 miles northward narrowing the Inner channel from 4 miles at its southern end to 1½ miles at its northern end, westward of Khor Nohud, where the bank turns westward and south-westward to the island.

The southern half of the bank is narrow. The depths on it are irregular and there are occasional shallow heads.

About 2½ miles westward of the southern end of this bank is a rocky bank 3 miles long in a north-north-westerly direction, with from 4 to 13 fathoms on it.

COAST.—From Khor Nohud to Khisá, the coast trends south-south-eastward about 22 miles and is fringed by reef, which in some places extends 3 miles from the shore. The reefs extend in long arms to the southward, between which and the adjacent portions of the coast reef are several inlets or khors, in which shelter may be obtained by small craft.

Khor el Birk, just southward of Khor Nohud, extends some distance inland to the northward, the western side of the entrance being partly formed by the coast reef extending southward about a mile from the point of the coast. Here a vessel may find good shelter from all winds. In the entrance is a 4-fathoms patch; within are 5 fathoms, mud. Here are remains of a strongly built wall of unhewn stone, but no houses. Shifting peak (not shown on the chart) bearing E. ½ S. leads to the entrance of Khor El Birk.

Water.—There are some wells of good water at Khor El Birk near the shore, where there are some date trees.

Hasr island (*Lat. 18° 10′ N., Long. 41° 29′ E.*) is a low wooded island surrounded by reef; it lies 7 miles southward of Khor Nohud, and is one mile from the shore.

Anchorages.—The reefs about Hasr island, and northward of it, extend about 3 miles from the shore, the breaks in them forming inlets both northward and southward of that island, with good small craft anchorages, which will be best understood by referring to the chart.

Abu-l-Mahlef island, 2½ miles south-eastward of Hasr island, is on the coast reef, and separated from the shore by a narrow channel. It is small and wedge-shaped in appearance. The reef extends westward 2 miles from Abu-l-Mahlef, from whence it bends south-eastward, leaving an inlet westward of Dahban receding 1½ miles in a north-north-westerly direction, in which it is not advisable to anchor with southerly winds. On the south side north of this reef, good anchorage, in about

Chart 8d, Red sea, sheet 4. Var. 2° W.

7 fathoms, with protection from a southerly wind, may be obtained.

North and South el Wasm (*Lat. 17° 52′ N., Long. 41° 34′ E.*) are two small khors about 2 miles apart, affording good anchorage and protection from wind, but it would be difficult for a sailing vessel to get out of the latter with a southerly breeze.

North el Wasm has a bar of sand across the entrance, connecting the shore reef with a shoal on the northern side of the entrance. The least water found on the bar was 2½ fathoms; within, are 6 and 7 fathoms, mud. The Wasm hummocks between these two anchorages are a guide to either; they are three steep and lofty hills in line when bearing East, the anchorages lying respectively northward and southward of this line.

Khisá is a small Bedouin village on the coast, 3 miles southward of South el Wasm.

Kotunbul island (*Lat. 17° 54′ N., Long. 41° 38 E.*), about 2 miles southward of Khisá and 2 miles distant from the nearest part of the mainland, is about half a mile in length, and rises to a rugged peak like a wedge 400 or 500 feet high, with a steep ascent on its northern side, the only accessible part. The summit is only a few yards long and very narrow, declining perpendicularly on the south and west, but on the east with a steep slope.

The rocks on the island are volcanic, but there is no appearance of eruptions having taken place for many years. A reef extends 5 cables southward from Kotunbul.

There are depths of 10 to 12 fathoms between Kotumbul and the mainland. About 3 miles southward of Kotumbul and 3½ miles westward of Widan, is a shallow patch having 30 fathoms round it.

Simer island (*Centre, Lat. 17° 47½′ N., Long. 41° 22½′ E.*), lies south-west 15 miles from Kotunbul island. It is 1½ miles long east and west, and half a mile wide; it is very low, consists of coral and sand, and is principally covered with decayed wood.

Shoal.—A shoal, 5 miles long and nearly 3 miles wide, lies close northward and north-eastward of Simer island; the depths on it are from 3 to 20 fathoms, but there may be less; a rocky patch lies about one mile from the centre of its western edge. The shoal commences 1½ miles north-eastward of Simer, and there is a depth of 50 fathoms midway between them. A rocky patch lies 2 miles from its eastern edge; there are

Chart 8d, Red sea, sheet 4. Var. 2° W.

also, two small rocky patches 3½ miles south-east from the island, and two shoal patches of 3 and 4 fathoms about 4 miles south-westward of it.

Anchorage.—The soundings are deep round Simer island; but if anchorage is required, it may be conveniently obtained either on the large shoal north-eastward of it, or on its western edge.

Reefs.—About 10 miles south-south-west from Kotunbul island, and the same distance south-westward of Widan, the nearest point on the mainland, is a rocky shoal about 1½ miles long; and, one mile south-eastward of it, a rocky patch, with deep water around it. Nearly 2 miles southward of the large reef is a 4-fathoms patch.

Mamáli reefs.—**Mamáli Kebir** (*North point, Lat. 17° 39′ N., Long. 41° 41′ E.*) is 12 miles distant from the nearest shore, and is a rocky bank encumbered with patches, having deep water between them. It is 9 miles long, north-west and south-east, and 5 miles wide at its north-western end, but narrows to 1½ miles towards its south-eastern end.

Mamáli Seghir is a narrow coral reef, over which the sea breaks in some parts, extending in a north-north-westerly direction about 10 miles to its northern end, near which, and on the shoal, is the Matbakhein rock (*Lat. 17° 28′ N., Long. 41° 45′ E.*), about 15 feet high, and useful for fixing position.

One mile southward of the southern extreme of Mamáli Seghir is a rocky patch with deep water between the two; and, from 3½ to 5 miles eastward from the same extreme, is a group of three rocky patches in line east and west.

About 13 miles E. by S. ½ S. from Matbakhein rock, and the same distance from the shore, is a 3-fathoms patch, with deep water close to it.

Rocky banks.—About 9 miles E. by S. ½ S. from the southern end of Mamáli Seghir, is a rocky bank about 3 miles long north-west and south-east, by 2 miles wide, having depths of 3 and 4 fathoms.

Another rocky bank, 2 miles long, north and south, by one mile wide, and having as little as 2 fathoms, lies in an east-south-east direction 1½ miles from the bank last mentioned. A 2-fathoms patch, steep to, lies 1½ miles north-eastward of the eastern rocky bank.

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 2° W.

Firán island (*Lat. 17° 10′ N., Long. 42° 10′ E.*), 6½ miles from the shore, is on the western side of the Inner channel. The island is less than a mile in extent but covered with trees and bushes; its highest part forms a steep bluff to the westward, 60 feet above the level of the sea.

A small bank extends from the northern side of the island, but it is bad holding ground; a reef projects a short distance from the south-eastern point.

North Ghorab island, west-south-west, 9 miles from Firán, is rather high, little more than half a mile long, and has a small black rock off its northern end. North Ghorab island is on the western end of a bank of irregular depth about 5 miles long in a west-north-west direction, and 3 miles wide. The depths on the bank are from 6 to 20 fathoms, rock and sand. A good and deep channel exists between Firán and North Ghorab.

Shaura island is 9 miles south-south-east from Firán, and 3 miles westward from the nearest part of Ras Turfa. It is a small sandy island about 20 feet high covered with bushes and is at the south-eastern end of a bank of rocks and sand extending west-north-westward nearly 7 miles from the island. There are depths of 2 to 12 fathoms on the bank, some of the shoalest patches being near the north-western end.

Channels.—Shaura island and Ras Turfa are separated by the Inner channel 2½ miles wide, with a least depth of 7 fathoms. Between Shaura and North Ghorab banks is a deep channel 3 miles wide.

Coast.—Khisa to Ras Turfá.—**Widán** (*Lat. 17° 52′ N., Long. 41° 43′ E.*) is 7 miles south-eastward of Khisá; at this place, a narrow neck of land projects from the coast forming a semicircular bay three quarters of a mile wide and affording anchorage, but with good protection from southerly winds only; the depths within are 3 and 4 fathoms. As seen from the westward, this point of land has the appearance of an island.

Aspect.—Jebel Bakara is a high hill close to the sea on the northern side of Widan anchorage and Jebel Rakebat Khudair is a high hill ending in a cape to the southward; neither of these are shown on the chart. Jebel Widan lies 5 miles eastward of Widan, and 6 miles south-eastward from it is Jebel Husna-l-Majis with a fort on its summit; this hill fort is about 2 miles inland from the little khor of El Makra, a small inlet caused by a break in the shore reef about 8 miles south-eastward of Widan.

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 1° 50′ W.

El Majis, 12 miles south-eastward of Widan, is a small but well-peopled Bedouin village, off which the coast reef projects about 7 cables.

Kiyas.—About 9 miles south-east from El Majis is Kiyas westward of which is a reef 2 miles long and about one mile from the shore, with depths of 2 and 3 fathoms between it and the shore. At 1½ miles westward of this reef is a 4-fathoms patch.

Kutuf el Misri and Shukeik lie between El Majis and Kiyas at 3½ and 6½ miles respectively from the former. Anchorage may be found off both these places.

Khor el Etwid (*Lat. 17° 34′ N., Long. 42° 8′ E.*), 8½ miles south-eastward of Kiyas, has from one to 2 fathoms inside. A shoal, a mile long, lies off the south point of the entrance, with 3 fathoms between it and the shore; and 2 miles westward of the entrance and one mile off-shore, is a patch of rocks with one fathom of water. A 4-fathoms patch lies 1¼ miles north-westward from it. The village of Etwid is 5 or 6 miles inland.

Jebel Etwid is a very remarkable peak, lying north-east 10 miles from the entrance of Khor el Etwid, and easily known as it appears quite unconnected with the range of hills in the neighbourhood, and is much nearer the shore.

Shab Abu-l-luka is a portion of the coast reef, extending north-westward from the point of that name, which point is 8½ miles south-eastward of Khor el Etwid.

From point Abu-l-luka as far as Ras Turfa, 28 miles distant, the coast has a southerly trend, and, with the exception of Shab el Kebir, is clear of coast reefs.

Shab el Kebir is a part of the coast reef, the centre of which, 6 miles southward of point Abu-l-luka, projects 1½ miles from the shore and gradually tapers away to nothing northward and southward, the total length of the reef being, about 9 miles.

Anchorages.—From Widan to abreast of Firán island, there is anchorage all along the shore, off the places already named and shewn on the chart. In this vicinity, there are said to be many small villages a few miles inland.

Ras Turfá (*Lat. 17° 0′ N., Long. 42° 18½′ E.*), **Khor Abu-s-saba.**—Ras Turfá is the southern extreme of a narrow neck of low land covered with bushes, on the eastern side of which Khor Abu-s-saba, known to the natives by the name of Goze, extends about 13 miles to the northward; a one-fathom bar crosses the Khor about 4 or 5 miles above Ras Turfá beyond

Chart 8d, Red sea, sheet 4. Var. 1° 50′ W.

which for some distance are depths of from 4 to 5½ fathoms, but for some miles from its head the Khor appears to be choked by shoals, as is its eastern side throughout.

A reef extends a short distance off the south-eastern part of Ras Turfa, but there is good anchorage eastward of the point and southward of the bar in the outer part of the Khor in from 8 to 4 fathoms. At 1½ miles northward of Ras Turfa, in the Khor, is a small islet southward of which there is a bight, fit only for boats, but with 6 fathoms water.

The anchorage under Ras Turfa may be entered round either end of Ferafer island, but, if round the eastern end, caution is necessary, as the coast reef approaches the island within 1½ miles, and there are depths of only 2 and 3 fathoms along the northern shore of the island.

Ferafer island is a narrow low sandy island in front of the entrance to Khor Abu-s-Saba, its western end lying east-south-east 1½ miles from Ras Turfa, and, from that end, it extends 2½ miles in the same direction; from a distance it appears as three islands.

The Inner channel lies between Ras Turfa and Shaura island and is 2½ miles wide at this part.

Coast.—From Ras Turfa to Ras Musaghib (*Lat. 61° 14′ N., Long. 42° 43′ E.*) the distance is 52 miles in a south-south-easterly direction, but from Ras Turfa the coast falls back eastward nearly 10 miles, forming the deep bight of Karn-el-Wadah; from whence its trend to Ras Musaghib is more southerly. For the whole distance the shore is bordered by reef, and for 40 miles in a southerly direction from the town of Gizan the land is covered with jungle, and is without villages or inhabitants. Northward of Gizan, the coast-line is flat and sandy; whilst, southward, it consists of rocky cliffs.

Karn-el-Wadah is the deep bight eastward of Ras Turfa, and lies east-north-east from the eastern end of Ferafer island; it has from 6 to 8 fathoms water in the outer part, but the coast reef in this part extends about 2 miles off-shore.

Plan of Gizan on chart 8d, Red sea, sheet 4.

Gizan (*Lat. 16° 53′ N., Long. 43′ 39′ E.*).—The town of Gizan, 12 miles south-eastward of Ras Turfa, has a few square stone buildings, but consists principally of round grass huts with pyramidal tops. It has a fort on its southern side in a state of decay, and a small bazaar, scantily supplied with such dry provisions as the natives use; fresh meat and vegetables can be procured by giving a day's notice. Water

Plan of Ghizan on chart 8d, Red sea, sheet 4. Var. 1° 50′ W.

is very scarce. In 1834, the population was about 400, employed chiefly, as it still is (1881), in the pearl fishery on the banks in its neighbourhood.

Gizan hills cannot be mistaken and are a good landmark; they are close behind the town, and have other high land near them. The shore reef projects considerably about Gizan, and the soundings are irregular inside a depth of 6 or 7 fathoms.

Shoals.—A sandy 2-fathoms patch, with 6 fathoms close outside it, lies 1¾ miles south-westward from the fort; and, from the patch, a small white mosque in the town is in line with a remarkable rock on a hill behind it. There is also a bank of 3 and 4 fathoms, the shallowest part bearing N.W. by W. ½ W. 4½ miles from the fort; the bank is about a mile long, north-west and south-east, and lies directly in the route of a vessel rounding Ras Turfa and steering for Gizan anchorage.

The Anchorage is in 7 fathoms, about 2 miles off-shore, with the fort bearing E. by N. There is also an anchorage in 3½ or 4 fathoms about a mile off-shore, at a short distance from a rocky spot which shelters an inner anchorage for small boats off the town.

Chart 8d, Red sea, sheet 4.

Karn esh Shurra, 3½ miles south-eastward of Gizan, is a bushy point bordered by the coast reef.

Plan on sheet of plans 3017.

Khor el Wahla is a narrow boat inlet about 9 miles south-eastward of Karn esh Shurra. Off its entrance, rather more than 5 cables from the shore, small vessels may anchor in about 2½ fathoms; or farther south-eastward in about the same depth and 7 cables from Harrier reef would appear to be a better berth. That reef lies about 1½ miles south-westward of the Khor entrance, but it is only separated from the shore reef to the eastward by a narrow 2-fathoms channel.

Harrier reef is of coral formation, about 4½ cables long, north and south, 2 cables wide, and at its eastern edge is Sandy islet, about one foot above the sea level.

Caution is necessary in dealing with the natives at this place, as they were found to be hostile as lately as the year 1902.

Chart 8d, Red sea, sheet 4.

Ras Musaghib (*Lat. 16° 14′ N., Long. 42° 43° E.*).—From Khor el Wahla, the coast has a general southerly trend to Ras Musaghib, bordered throughout by a reef about a mile wide, except about 7 miles northward of the point where a ledge extends 3½ miles off to the Oreste shoal, presently described,

Chart 8d, Red sea, sheet 4. Var. 1° 50′ W.

and also at Ras Musaghib where the reef extends 2 miles off-shore.

Medi village.—Telegraph.—About 3 miles northward of Ras Musaghib is the village of Medi, which is connected by telegraph with Hodeida.

From Ras Musaghib southward to Loheiya, a distance of 33 miles, the coast forms a slight indentation and is skirted by reef of an average width of one mile; but, in a small bay 3 miles north-eastward of Loheiya, the reef stretches right across the entrance at a distance of 2 miles from the shore. Near the northern point of this bay is a small island a mile from the shore, and, one mile northward of it and 1½ miles from the shore, is a reef distinct from the coast reef. From Ras Musaghib southward to this bay, the depths in the Inner channel are very regular, from 5 to 7 fathoms everywhere within a mile of the coast reef.

Islets and banks. Abu Shukar island lies 6½ miles south-westward of Ras Turfa, and between them is a channel 5 miles wide and from 20 to 30 fathoms deep. The island is composed of branching coral, cracked and broken into numerous pieces forming deep clefts through some of which the water passes, while others are filled with sand and earth where a few jungle trees have sprung up.

Abu Shukar bank, on the north-eastern part of which stands the island from which the bank is named, is of triangular shape about 8 miles long north-west and south-east, by 5 miles wide at its northern end, and tapering to 2½ miles near its southern end. On this bank are five islands besides Abu Shukar. At the south extreme is Seil Shertaf, about half a mile long; about 1¼ miles north-eastward of that island is Dhu Raji island. The other three islands lie in the middle of the bank north-westward of Dhu Raji. The depths on Abu Shukar bank are very irregular, and there are probably shoal heads on it; the bank is steep-to.

Jezírat Hibar, 7½ miles southward of Turfa and 7 miles westward from Gizan, is about half a mile square and surrounded by reef.

Umm el Kura (*Lat. 16° 49′ N., Long. 42° 24′ E.*).—At 3 miles south-south-eastward from Jezírat Hibar is a cluster of five islets on a sand and coral bank. Umm el Kura is the north-western, and Umm el Karib, close beside it, the north-eastern islet. Upwards of a mile from Umm el Kura in the direction of Jezírat Hibar is a one-fathom patch, and a sunken patch lies at the same distance south-westward of Umm el Kura.

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 1° 50′ W.

Amina island is one mile southward of the Umm el Kura group and has a small island about 3 cables southward of it; a rock lies about a mile eastward from the northern end of Amina, and a 5-fathoms patch 2 miles eastward of the small island.

The narrowest part of the Inner channel between Umm el Karib and the shore reef off Gizan is 4 miles wide, with from 9 to 14 fathoms, and between Jezirat Hibar and a 3-fathoms patch north-eastward of it, it is 3 miles wide.

Kadheiya, Jaferi, and Dahret Jaferi are three little islets on the western side of the Inner channel, 5 miles distant from the shore reef, the depths from the islets towards the shore reef decreasing from 12 fathoms. Kadheiya and Jaferi are on one bank upwards of 2 miles long, north and south, by 1½ miles wide, with from 2 to 3 fathoms between them. Dahret Jaferi is on a detached reef. These islets are steep-to and may be passed on either side.

Ashik island (*Lat. 16° 21′ N., Long. 42° 36′ E.*).—**Bank.**—S. by. E. 20 miles from Jaferi, near the southern end of the Ashik bank, is the small island of Ashik, with two larger ones on the same line to the northward of it, at distances of 7 cables and 2 miles respectively; the nearest is about 300 yards long, the northernmost, and largest of the group, about half a mile long. These islands are on a narrow bank which extends about 7 miles northward of Ashik and 1½ miles southward from it, the northern part having from 2 to 5 fathoms water. Between this bank and the coast reef, the channel is from 4 to 5 miles wide, with from 9 to 10 fathoms in the fairway; at the southern end of the bank, however, the channel is narrowed to 2 miles by the projection of Oreste shoal from the mainland. Ashik bank, like Towak island, 3 miles southward of Ashik, may be passed on either side.

Towak island (*Lat. 16° 18′ N., Long. 42° 38′ E.*) lies 3 miles south-south-eastward from Ashik island. Shoal water extends about 2 cables from the north and south extremes, and also a short distance from the eastern side of this island. The channel on either side of it may be taken, avoiding Oreste shoal eastward of it.

Oreste shoal, on which the Austro-Hungarian steam vessel *Oreste* struck in 1876, lies about 1⅓ miles north-eastward of Towak island; it has as little as 7 feet water and apparently, with that depth, is about a cable in length east and west, but is connected with the shore about 3 miles distant by a sunken ridge with from 1½ to 2 fathoms.

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 1° 50′ W.

Umm el Hommadh island, $5\frac{1}{2}$ miles westward from Towak, is a small coral island about $1\frac{1}{2}$ miles inside the edge of Farisan bank which bounds the western side of the Inner channel. Another small island lies close northward of it. There are also two rocky patches in its vicinity, one at $1\frac{1}{2}$ miles eastward of Umm el Hommadh; the other, 5 cables north-eastward of the same.

Ghorab island (*Lat. 16° 9′ N., Long. 42° 38′ E.*), small, low, and sandy, is also on the bank which bounds the western side of the Inner channel and about 2 miles within its eastern edge. From Ghorab island, the same bank projects as a long rocky tongue $5\frac{3}{4}$ miles in a north by east direction, having 3 fathoms at its northern extreme, but leaving a channel 14 fathoms deep and $3\frac{1}{2}$ miles wide, between it and Towak island.

Baas island is a small sandy island on the southern end of the same reef as Ghorab island, from which it is distant fully 8 miles to the southward. Northward of Baas are the two small islands Esh Shaban and Uwaf. About 5 cables southward of Bass is a one-fathom patch, and also a similar patch on a point of the reef distant, west-north-west, 2 miles from the same island.

The Inner channel abreast of Baas is 5 miles wide, with depths of from 12 to 5 fathoms, the deepest water being here, as in most parts, on the western side of the channel.

Nasib shoal, on the north-western end of which is an islet $3\frac{1}{4}$ miles south-westward from Baas island, is about 2 miles long, north-west and south-east, and besides the small patch above water near its north-western end, is nearly dry in other parts.

Dahayir island (*Lat. 15° 51′ N., Long. 42° 38′ E.*), is a small sand cay, occasionally covered, $2\frac{1}{2}$ miles south-south-west from Nasib shoal, and south-south-eastward from it are two others of the same description, the whole occupying a space of 2 or 3 miles, and each of them encircled by reef. There is a narrow passage between Dahayir island and the other two, but it is better to pass either eastward or westward of the whole group.

A rock, which uncovers about 3 feet, lies 2 miles south-eastward from the southern island of the Dahayir group. About 2 miles eastward of this is another rock which also uncovers and must not be closely approached, as the water is shallow near it. The Inner channel southward of the Dahayir islands is, owing to these obstructions, barely one mile wide, with a depth of about 5 fathoms.

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 1° 50′ W.

Zurbat, Ajusak, and Dorama islands are on the eastern edge of a narrow and shoal bank about 8 miles long, with 4 or 5 fathoms close to its eastern side. The northern end of Zurbat is 4 miles west-north-west from Dahayir.

Hamar island (*Lat. 15° 45′ N., Long. 42° 35′ E.*), about 4 miles north-westward of the mainland just northward of Loheiya, is low, nearly 3 miles long, north-east and south-west, 8 cables wide, and has one or two fishing huts on its western side. A small bight in the reef off its north-eastern part, affords anchorage for small boats. The island is fringed by reef on both sides, extending also from the south-western end nearly a mile towards the eastern part of Bawarid island; therefore, if passing between it and Bawarid, keep nearest to the latter. Firewood may be had for the cutting on Hamar, but no water.

Chart 113, Jebel Tier to Perim.

Bawarid island is on the same bank as Entufash island, westward of it, and described at page 386; it is about 1½ miles long, low, and near the eastern extreme of the fringing bank which, in this part, has from 5 to 8 fathoms water over it. Bawarid is distant from Hamar island 2¾ miles in a south-westerly direction, and between them is a 12-fathoms channel about 1½ miles wide.

Plan of Loheiya on 8d.

Urmek island, 5 miles south-westward of Loheiya, is about 2¾ miles long east and west, and one mile wide. It is low, sandy, and destitute of water; on it is a fishing village which has to be supplied with water from Loheiya. In the centre of the north-eastern and south-western sides are two small mosques. Between the eastern point of the island reef and the extensive reef off the mainland shore, the Inner channel is less than 7 cables wide, and the depth from 5 to 7 fathoms; the channel westward of the island seems preferable.

Shoals.—At from 2 to 2½ miles north-eastward from the north-western end of Urmek island lies a one-fathom patch; a shoal extends from the north-western end of the island about 1¾ miles with from 2½ to 3½ fathoms over it. Vessels passing northward of Urmek should avoid these shoals by keeping over towards Bawarid island. Discoloured water has also been observed to extend about 1½ miles in a west-south-westerly direction from Urmek island.

General chart 2523.

Plan of Loheiya on chart 8d, Red sea, sheet 4. Var. 1° 50 W.

LOHEIYA, on the mainland (*Lat. 15° 42′ N., Long. 42° 39′ E.*), is on the northern side of a small shallow bay eastward of the islands last described. The distant land behind Loheiya is high and mountainous, but so distant as to be seldom visible. Behind the town (a collection of miserable looking straw huts) are a few hills, but the highest, on which the fort stands, is not more than 150 feet above the level of the sea. Sugarloaf is the northernmost of two small peaks eastward of Loheiya. Jebel Kusha, or Barnhill, south-eastward of Loheiya, appearing somewhat like a barn.

The town of Loheiya is under a Turkish governor; the trade is principally in grain and coffee, and a considerable traffic is carried on by dhows between this town, Jidda, Hodeida, and Aden. In 1881, its population was estimated at 2,000, including its garrison of about 120 Turkish soldiers and a few British Indian subjects, but no Europeans.

Telegraph.—There is telegraphic communication between Loheiya and Hodeida.

Supplies.—A few sheep may occasionally be obtained; water also, but it is said to be scarce and brackish.

Reefs.—A narrow rocky reef parallel to the shore lies 1¼ miles westward of Loheiya; it is about 2 miles long north and south, and has two rocky one-fathom patches about a mile westward of it, with 3½ and 4 fathoms near them.

Harbour.—The western point of Loheiya bay has a rocky reef extending 2½ miles south-westward from it and to within 1¼ miles of the eastern end of Urmek island; the harbour or anchorage and the passage up to the town lie between this long spit and the reef which occupies the whole of Loheiya bay.

Anchorage.—Anchorage in from 4½ to 3 fathoms, fit for small vessels, will be found in the entrance of the channel leading up to the town, distant about 3 miles in a north-easterly direction, and which carries a depth of 6 feet up to the town. There are some dangerous patches about the entrance, therefore this anchorage cannot be recommended for general use.

Buoy.—A white conical buoy should mark a shoal on the eastern side of the entrance; it should be left on the starboard hand in entering, and if in position, which cannot be depended on, is a good guide for anchoring.

Outer anchorage.—The best anchorage for other than small craft is in the Inner channel about 4 or 5 miles distant both from Urmek and from Loheiya, in from 7 to 14 fathoms.

General chart 2523.

Plan of Loheiya on chart 8d, Red sea, sheet 4. Var. 1° 50′ W.

Tides.—It is high water full and change, at Loheiya at 1h. 30m.; the rise is about 3 feet.

Directions.—For vessels from the westward bound to Loheiya, two channels are the most easily recognised and most frequented.

In taking the southernmost pass between Okbán and El Bodhi islands, and then between the latter and Kandamán Kebir, passing eastward of Urmek island, known by its reddish coloured mosque, and two conspicuous palm trees. Then pass between Urmek and the shore reef, at about 6 miles from the latter, and when the mosque on the south-western side of Urmek island bears W. by S. ¼ S., or, the first high tower a little northward of Loheiya fort on with the northernmost of two small mounds in line bearing N.E. ¾ N., the latter course may be steered to the anchorage. If bound to the outer anchorage the channel westward of Urmek seems preferable.

The northern channel lies northward of Okbán, Kandamán Seghir, and Urmek. Care must be taken to avoid the shoals about 4 miles westward and north-westward of Kadamán Seghir, by keeping southward of a line joining that island to Okban summit, and to give a good berth to the north-western end of Urmek, in order to avoid the foul ground extending 1¾ miles from it in that direction.

Chart 143, Jebel Teir to Perim.

Kadamán Seghir island (*Lat. 15° 35′ N., Long. 42° 29′ E.*).—from the south-western part of Urmek island, Kadamán Seghir is distant 6 miles in a west-south-westerly direction. It is small, low, sandy, and surrounded by a reef.

Kadamán Kebir island, on which is a clump of bushes, is 4½ miles south-westward from the nearest part of Urmek island. From its western end, a reef extends nearly 1½ miles in a west-south-westerly direction, and has 5 fathoms water at its extreme. There is a 3-fathoms patch about 2 miles westward from Kandamán Kebir.

A reef, extends about 2 miles north-eastward from Kandamán Kebir, in the northern approach to Kamaran bay.

Shab Badinjan.—About 4½ and 5½ miles south-south-eastward from Urmek island, and 2 and 3 miles off Ras Haram, are the two small shoals which together form Shab Badinjan. At 10 miles nearly in the same direction from Urmek is another small shoal 3 miles from the mainland shore. These shoals may all be seen by a good look-out and passed on either side, though it is as well to pass westward of them in going from Kamaran bay through the Inner channel to Loheiya or the contrary.

General chart 2523.

Chart 143, Jebel Teir to Perim. Var. 1° 50′ W.

El Bodhi, about 4 miles south-westward of Kandaman Kebir, is a low sandy island about 3 miles long, east and west, surrounded by a reef extending 1½ miles off the southern side, with 5 or 6 fathoms, rocks and sand, on its edge. At 1¼ miles north-eastward from its eastern end is a one-fathom patch.

A good channel exists on either side of El Bohdi; that between it and Kamaran is from 2 to 2½ miles wide, with from 10 to 23 fathoms.

Okban island (*Northern end, Lat. 15° 32′ N., Long. 42° 21′ E.*).—About 4½ miles westward from El Bodhi is the south-eastern end of Okban island, which from thence extends about 5 miles in a north-westerly direction. It is low and sandy in the centre with a hill on its north-western end, and a bluff on the south. There is deep water on its eastern and western sides. Reef extends nearly a mile from the southern end of the island, and 2 miles off the northern end, and is steep-to.

About 4 miles southward of El Bodhi is a small sandy island with a reef extending 5 cables from its western side, and for a less distance off its eastern end; there is a channel with 5 fathoms water between it and Kamaran island reef.

Shoals.—At 4 miles westward of the north-west point of Kamaran and 6 miles south-south-west of El Bodhi is a bank 4 miles long in a north-north-westerly direction, with a depth of 2 fathoms one mile from its north-western end, and from 4 to 9 fathoms on other parts, rock and sand; it is steep-to.

At about 5 miles south-westward of the shallow head just mentioned is another bank of rock and sand, with 4 fathoms on its shoalest part near the southern end, and from 7 to 9 fathoms elsewhere; it is nearly 3 miles long, north and south, and is steep-to; but, in 1901, H.M.S. *Scout* obtained soundings of 8 and 10 fathoms just southward of this bank, probably an extension of it. These shoals may generally be seen by the discoloured water.

OUTER CHANNELS.—A good channel leads southward of Okban and El Bodhi into Kamaran bay, and also between Okban and El Bodhi towards Loheiya. Any of these channels may be used by keeping a look-out for the patches, which may be seen except in hazy thick weather.

There is a good channel between Kamaran island reef and the small island 2 miles off it. The bluff on the southern side of Okban island bearing about N. by W. leads between the inner and outer shoals westward of Kamaran island.

General charts 143, 8d, and 2523.

Chart 143, Jebel Teir to Perim. Var. 2° W.

Coast.—From Loheiya southward, the shore is bordered by reef which in some places stretches off upwards of 3 miles. Abreast of the northern end of Kamaran island, where the remarkably fine bay of that name commences, the Inner channel is 5 miles wide.

Plan 543, Kamaran passage and southern approach.

KAMARAN BAY, about 10 miles in length by 7 miles in breadth, affords capacious anchorage for all classes of vessels in from 5 to 15 fathoms, over mud. It is formed by two promontories extending some 10 miles from the average line of coast on the east and south and by Kamaran island on the west.

The northern entrance between the shoals on either side is about 4 miles wide and presents no difficulty.

The southern entrance, $1\frac{2}{10}$ miles wide is reduced by the shallows which extend from both points to a breadth of about 2 cables; for large vessels, *see* page 364.

Mahasin, a promontory jutting out into the middle of Kamaran bay from the southern shore, divides it into two bays, the western portion being Kamaran passage. Jebel Mahasin, 190 feet in height with two small round peaks, may be easily recognised on a fairly clear day as being the highest ground near the shore on the mainland. A conspicuous blockhouse stands on the south-eastern slope of this hill, about 600 yards from the summit and about $5\frac{1}{2}$ miles north-eastward of Ras el Bayadh the east point of the southern entrance; the blockhouse is 25 feet high, and is 128 feet above the sea level.

Saliff.—The mosque and village of Saliff, at the foot of Jebel Mahasin, are rarely seen until the vessel is inside the southern entrance. At this place are large rock-salt works and a pier extends upwards of 300 yards from the shore in a west-south-westerly direction as far as the 5-fathoms line. Four mooring buoys lie near the pier-head for the convenience of steam-vessels going alongside to load with salt.

Ras el Bayadh (*Lat. 15° 16′ N., Long. 42° 36′ E.*).—From the western point of Jebel Mahasin, Ras el Bayadh is 5 miles distant to the south-westward, the flat sandy coast between forming Ghub Dieno, a spacious bay, then trending westward and terminating in Ras el Bayadh, the eastern point of the south entrance to Kamaran bay. The point is low and sandy, and with a few trees about a mile inland; it is surrounded by reef to the distance of a quarter of a mile.

The coast southward of the point, is bordered by a reef to about a quarter of a mile; small boat harbours are met with,

Plan 543, Kamaran passage and southern approach. Var. 2° W.

formed by fissures in the reef, and where there may be small fishing villages. Ras Isa is 6 miles south-eastward of Ras el Bayadh, for which, *see* page 388.

SOUTHERN ENTRANCE.—This entrance, the commencement of the Inner channel from the southward, leads into Kamaran passage and Kamaran bay. It is rather over a mile in breadth between Ras el Yemmen on the west and Ras el Bayadh on the east; the navigable width for vessels of moderate or heavy draught is reduced to about 2 cables, in which a depth of 6 or 7 fathoms may be carried, by the flat which extends about 8 cables from the western shore and about 2 cables from the eastern shore, the extremes of which are marked by buoys.

Arab shoal (*Lat. 15° 15′ N., Long. 42° 31′ E.*), of sand and coral, lies in the approach to the southern entrance of Kamaran bay, N.N.W. $\frac{3}{4}$ W., $4\frac{1}{6}$ miles from Risha island beacon, south side of the approach, and with Ras el Yemmen bearing N.E. by E. $\frac{3}{4}$ E. The least depth on the shoal is $2\frac{1}{2}$ fathoms, but depths of 4 fathoms, part of the same shoal, extend 5 cables in the direction of Risha island.

The approach to the south entrance outside the 5-fathoms line, between this shoal and Risha is about 2 miles wide with 14 fathoms in the fairway; the 5-fathoms line extending about one mile from Risha, and three quarters of a mile from the $2\frac{1}{2}$-fathoms patch in the direction of Risha.

Between Arab shoal and Kamaran island, is a channel about 2 miles wide with depths of 16 fathoms.

Rishah island, about 5 miles south-south-westward from Ras el Bayadh, on the eastern side of the approach to the southern entrance, is a low sandy island partially covered with scrub, and surrounded by a reef which extends about one-third of a mile from it, except at its north-east corner where there is no reef. The 5-fathoms line is about $1\frac{1}{3}$ miles distant from the northern part with shallow water between, but on the east and west the reef is fairly steep-to. Its limit south-eastward has not been defined, but it apparently extends about 2 miles.

In mid-channel, between it and the mainland, 3 miles distant, there are depths of 13 to 15 fathoms.

Beacons.—Rishah being a useful mark, but difficult to see when approaching Kamaran from the southward, has had erected on it a stone pillar beacon about 25 feet high, painted white, and visible from one to 5 miles, according as the day is bright or dull. A bush or small tree on its western end has been seen 5 miles off.

General charts 143, 8d, and 2523.

Plan 543, Kamaran passage and southern approach. Var. 2° W.

A fairly good temporary anchorage may be obtained to the northward of Rishah. At night, anchorage depths may readily be picked up by the lead, and it is better to anchor than to stand on and off, on account of the uncertain currents, and the difficulty of fixing the vessel's position accurately by bearings of the low land which it is almost impossible to distinguish.

Buoys.—The following buoys are moored at the southern entrance to Kamaran bay, red on the eastern side and black on the western.

A red buoy with staff and cylinder, in 5 fathoms, marks the edge of the 5-fathoms line westward of the boat harbour, eastern side of the approach. Bayadh telegraph hut, which bears from it N. 37° E.

A red buoy, with staff and triangle, in 4½ fathoms, marks the extreme of the shoal extending from Ras el Bayadh 1¾ cables N.W, by N. from the point.

A black conical buoy with staff and ball, in 4 fathoms, marks the extreme of the shoal extending from Ras el Yemmen, at 5 cables N.W. by W. from Ras el Bayadh.

These buoys marking the edges of the reefs on either side, should not be implicity relied on, as they frequently break adrift. They are more to be depended on during the pilgrim season than at other times.

Directions for the South entrance.——The position of Kamaran bay makes it a convenient anchorage for vessels obliged to seek shelter through stress of weather. It is often used by steam-vessels proceeding southward through the Red Sea during the winter season; and, as the strong southerly breezes which then prevail frequently bring hazy weather, care is required in making for the bay, as Kamaran island is low and the currents strong and uncertain.

Approaching from the northward pass between Arab shoal and the long fringing Kamaran island, in depths of 16 to 18 fathoms over a breadth of 2 miles. The reef fronting the island only extends a few cables off, is fairly steep-to and easily seen.

In approaching this entrance from the southward, pass eastward of Risha island, on which stands a white stone beacon about 25 feet high, which can be seen from one to 5 miles distant, according as the day is bright or dull. Keep in about 14 or 15 fathoms along the coast reef, and having made the south-western sandy point of Bayadh, haul round it as requisite for the entrance, and steering in with the southern summit of

Plan 543, Kamaran passage and southern approach. Var. 2° W.

the high land of Jebel Mahasin N.E. by E. $\frac{1}{4}$ E. which leads through the channel in not less than 8 fathoms about 3 cables off the southern shore, where is the best water between the red and black buoys if they are in place, but bearing in mind the cautions previously given as to the untrustworthiness of the buoys.

Coming from the northward by the Inner channel and having passed Shab Badinjan, situated 4 miles northward of Kamaran island, course may be shaped to pass about 2 miles eastward of Kamaran island to Kamaran anchorages or the harbour. If proceeding through the southern entrance the above directions should be reversed.

Tides.—It is high water, full and change, at Kamaran harbour at 1h. 4m.; springs rise $3\frac{1}{4}$ feet, neaps 2 feet. Springs occur from 3 to 5 days after full or new moon, but the rise and fall is greatly influenced by the winds, the tide sometimes standing still for several hours during strong southerly winds.

The tidal streams are strong in the entrance, but set almost straight through. The discolouration of the water at this part is very remarkable, especially north-eastward of Ras el Bayadh when the in-going stream is strong, as there is a perfectly marked line of light and dark water extending northward sometimes for nearly a mile, the light part being right across the channel, and the dark part in Dieno bay. This discolouration is not confined to the entrance, but extends to Risha island, Arab shoal, and well off Ras el Maaram; the colour gives no indication of the depth, dark-coloured water being found at times on the $2\frac{1}{2}$ fathoms patch on Arab shoal, and very light-coloured water in 20 fathoms.

Anchorage.—Good anchorage may be found all over Kamaran bay, the best, in strong southerly winds, being in Ghub Dieno or Dieno bay, close under the land in from 17 to 20 fathoms, where smooth water will be found.

KAMARAN ISLAND.—The northern point of this island (*Lat. 15° 28′ N., Long. 42° 37′ E.*) is nearly 15 miles southward of Loheiya. It is about 12 miles in length, north and south, and at the northern end is less than 2 miles wide, but for the greater part is about 4 miles in width. The island is composed of hard rock intermixed with sand, and, in some parts, earth capable of cultivation; there are some spots on which date trees flourish. It is generally low and sandy in appearance, rising a little towards the southern end, where there are a few hillocks; on the northern side there is swamp and low scrub.

General charts 143, 8d, and 2523.

Chart 143, Jebel Teir to Perim. Var. 2° W.

Except a small portion of its eastern side, the island is bordered by a reef, which is more than half a mile wide at 2 miles northward of Ras el Yenmen, the south-eastern point. A shoal plateau, however, extends from this point towards Ras el Bayadh the eastern point of the southern extreme, for about 8 cables, with with depths of 2 to 3 fathoms on it, over hard sand and weed. The reef off Ras el Bayadh is comparatively steep-to.

Beacon.—A beacon consisting now merely of a pole stands on the shore of Kamaran island, about 1,100 yards westward of the old telegraph hut; it is by no means conspicuous.

Enlarged plan on plan 543.

Kamaran harbour (*Lat. 15° 21′ N., Long. 12° 36′ E.*).—There is very good anchorage in Kamaran harbour in 7 fathoms, mud, with the ruined fort bearing S.W. about 2 cables. The entrance to this harbour is $1\frac{3}{4}$ cables wide between the 5-fathoms line; it is, however, well buoyed in the pilgrim season, but afterwards the buoys are removed, and the whole place practically deserted except by fishermen.

Quarantine anchorage.—Vessels anchoring in the Quarantine ground, northward of the harbour, must be careful of the point of reef which extends 6 cables from the shore, $1\frac{1}{8}$ miles northward of the harbour.

Buoy.—At about 5 cables from the shore, in this anchorage, is a shoal about 150 yards long, east and west, with from 2 to 3 fathoms water; its centre is marked by a red conical buoy with staff and ball moored in $2\frac{3}{4}$ fathoms. From it North point bears S. 34° W. $5\frac{1}{10}$ cables. For other shoal patches inshore of the buoyed patch, the plan is the best guide.

Landing.—There are two piers on the northern side of Kamaran harbour. At the outer one, a stone pier, about 100 yards long, dhows obtain pratique on arrival; a small house stands on its outer end. In the bay next the Quarantine anchorage are two piers, which afford good landing places for boats.

Quarantine.—Pilgrim vessels from India or other parts beyond the Red sea, if carrying more than 5 pilgrims per 100 tons, have to call at Kamaran and perform a quarantine before proceeding to Jidda. In case of cholera breaking out in Hedjaz, all ships for Yemen, Basra, &c., are required to perform quarantine at this place and to get free pratique before proceeding to their destination. The Lazaretto will accommodate about 6,000 pilgrims, and is available from about 15th November to 9th May.

General charts 143, 8d, and 2523.

Enlarged plan on plan 543. Var. 2° W.

During the pilgrim season of 1904–5, pilgrims to the number of 22,424 were quarantined at Kamaran; the numbers subject to quarantine vary considerably according to season, thus, in the three previous seasons, the numbers were respectively, commencing with the earliest, 17,729, 15,821, and 32,452.

Winds and weather.—Southerly winds are almost continuous from October to March, at times blowing very hard, and during these months rain falls five or six times; the whole of this period the climate is very unhealthy, with the wet and dry bulb thermometer standing about the same height. Northerly winds, very hot and dry, blow from April to September.

Town.—Besides the town of Kamaran (*Lat. 15° 21′ N., Long. 42° 36′ E.*) there are five small villages on the island; the total population being probably about 2,000. The town of Kamaran at the head of the harbour is said to be increasing; there are several large brick and stone buildings, including condensing and ice making works, &c. The inhabitants are mostly fishermen, some being employed in the pearl fishery. The officials of the island are the Mudir, captain of the port, and the medical inspector and staff of the lazarette.

Supplies.—At the town of Kamaran, beef and mutton can be obtained in small quantities; vegetables are difficult to procure, as they mostly come from Hodeida. During the pilgrim season there is always a good supply of condensed water, and ice, mainly for the use of the pilgrims; but on application to the quarantine authorities, condensed water and ice can be procured. The water is conveyed to the lazaretto by pipes. It is not advisable to use water from the wells for drinking purposes. Coal can only be obtained by freight steamer from Aden or Perim and should be ordered by telegraph.

Shipping.—There is no late return of shipping visiting this place, but in 1901, the number of vessels entering the port was 1,141, representing an aggregate of 111,842 tons. Of this total, 75,205 was British tonnage. In 1905, both number and tonnage had increased, and of the latter 82 per cent. was British.

Communication.—Telegraph.—The quarantine station at Kamaran bay is connected by submarine cable laid from Ras el Maaram to Saliff on the mainland shore, and thence by land line with Hodeida, and thus with all parts by the general system. Mails are sent and received from Hodeida weekly.

General charts 143, 8d, and 2523.

Charts 8c and 8d, Red sea, sheets 3 and 4. Var. 2° W.

FARISAN BANK.—General remarks.—This extensive shoal and rocky bank, the northern point of which is in lat. 20° 4′ N. and lies 12 miles westward of Lith, continue as far southward as Kamaran island, the eastern or inner edge of the bank forming the western side of the Inner channel on the Arabian side, which channel has been described in the preceding pages of this chapter. The Farisan bank, including Kamaran island within its limits, is about 320 miles long in a general south-south-easterly direction, and from its northern extreme to the parallel of 18° N. is encumbered with shallow patches, so that between those limits no vessel should attempt to cross it.

Captain Elwon remarks :—

"In prosecuting the survey, we have been in the *Benares*, from the nature of the duty, amongst all these islands, reefs, and banks, where the depth of water permitted, excepting that part of the Farisan bank to the south-west of Abulat island, and also immediately above and below Sabaya and Kutna islands, which was found too dangerous. I think few navigators will frequent the channels amongst the islands and reefs on the broadest parts of the banks to the north of 17° of latitude, on account of the deep water and great distance of either coast, which render it probable that they would not be able to procure anchorage before nightfall, and therefore would be obliged to heave-to amongst the reefs and islands for the night.

"Should it ever become necessary to pass from the central to the inner channels on either side the Red sea, it will be requisite to make certain of the vessel's situation, so as to be at a moderate distance from the reefs at daylight, in order to have as much of the day as possible to run across with; and a sharp look-out must be kept for the sunken patches, some of which can only be seen in clear weather, and when the sun is in the opposite direction to the ship's course."

Channels.—There is no safe passage across that part of Farisan bank called the Shab Farisan, which is a succession of reefs on the outer side of the bank, 53 miles long in a south-easterly direction, commencing from about lat. 17° 3° N., long. 41° 13′ E., and terminating south-eastward with Marrak island. Southward of the Farisan islands are many channels across the bank, which, however, from their nature, require the utmost care in navigating.

The reefs, shoals, and islands of the Farisan bank at the northern and southern ends, as well as those along its whole length on the eastern side, will be found fully described with the description of the Inner channel southward of Lith.

General chart 2523.

Charts 8c and 8d, Red sea, sheets 3 and 4. Var. 2° W.

The description now returns to the northern end of the bank and proceeds in regular order, commencing from the northward with the shoals bordering on the western side of this immense bank, and which consequently concern the safe navigation of the central track through the Red sea.

The positions of the several reefs given here are considered doubtful.

Chart 8c, Red sea, sheet 3.

Abulat island, the northernmost on the Farisan bank, with Katat Jebel and Shab Jenab, the shoal patches northward and westward of it, are described at page 336.

Shab Suleim (*Lat. 19° 58′ N., Long. 40° 1′ E.*).—About 4½ miles westward from the north-western point of Abulat island is the northern end of Shab Suleim, a breaking reef 3½ miles long, north and south, by one mile wide.

Shab Sahabak is a breaking reef between Shab Jenab and Shab Suleim, the greater part of the reef lying southward of an imaginary line joining them. There is deep water close to these shoals.

Dohra, Marma, El Jedir, and Matathu islands.—Dohra is 14 miles S.W. by W. ½ W. from the southern end of Abulat island; Marma is 1½ miles eastward of Dohra; El Jedir is 1¾ miles southward of Marma; Matathu is 2½ miles southward of Dohra. All these islands are of sand and coral, very low, and with deep water close to. On Matathu there were a number of graves.

A small patch, which breaks at times, lies 5 cables north-westward of Matathu.

Danak island (*Lat. 19° 31½′ N., Long. 40° 2½′ E.*), 15½ miles southward of Matathu, is a low coral island surrounded by reef, with no bottom close to at 130 fathoms. At 5 miles northward of it is Shab Shair, and north-west one mile from the latter is Shab As-saba, north-eastward of which and 1½ miles distant is another unnamed shoal.

About 5 miles north-eastward of Danak is Shab el Girb, and in the same direction at 1½ miles from Danak is a shoal patch; at the same distance south-eastward of Danak is a breaking patch; and about 3 miles to the northward of that island is Shab Amar, a half-moon-shaped reef with 6 and 8 fathoms off its eastern edge. Within or eastward of this cluster, from the masthead, the bank appears to be much obstructed by shoals.

General chart 2523.

Chart 8c, Red sea, sheet 3. Var. 2° W.

Shab el Jebbara lies 4 miles east-south-eastward from Danak island.

Jebbara is a low sand and coral island, surrounded by reef, with no bottom at 105 fathoms close to. It lies 4 miles southward of Danak island.

About 2 miles north-westward of Jebbara is Shab el Mudharr; and about the same distance north-eastward of it is Shab el Mahdhun, with a small sandbank on it.

Shab Assaka is a low rocky coral island on a reef about 4 miles from Jebbara island in a south-south-easterly direction, having no bottom at 105 fathoms close to it; there is a patch of 17 fathoms about 9 miles west-south-westward from it near the outer edge of the reefs.

Shab Dauka, its northern end, 7 miles southward of Shab Assaka, extends as a breaking coral reef about 4 miles in a south-south-easterly direction. About 3 miles south-westward from the centre of Dauka reef is a small one-fathom shoal with no bottom at 145 fathoms near it.

Shab Mubárak (*Lat. 19° 0′ N., Long. 40° 8′ E.*) lies 11½ miles S. by W. from the southern part of Dauka reef; it is a breaking shoal at the outer part of the reefs in this neighbourhood.

Murabit el Khail shoals.—Ring reef.—At 8 miles eastward from Shab Mubárak is a breaking patch, the commencement of these shoals, and east-north-east 1½ miles from it is a narrow breaking reef about 3½ miles long in an east-south easterly direction. About 3 miles south-east of these is Ring reef, composed of coral, about 2 miles in length, with breakers all round the outer edge and apparently deep water inside.

Shaker island (*Lat. 18° 52′ N., Long. 40° 25′ E.*) is a low sandy island on a coral reef, with some bushes on it, and no bottom at 120 fathoms off its northern point. About 5 cables westward of it is the north-eastern end of Shab Maras, a breaking shoal, which from thence extends south-south-west 2½ miles; there is no bottom at 70 fathoms between them.

Tedkar island, 12 miles east-north-eastward from Shaker island, is a small low island with a few bushes on it, and a long reef extending off its southern end; there is no bottom at 50 fathoms between it and Muska island, 5 miles to the southward, a small low island on a coral reef, with no bottom at 50 fathoms close to. A breaking reef lies 9 miles north-west-

Chart 8c, Red sea, sheet 3. Var. 2° W.

ward from Tedkar, another 4 miles north-north-east from it, and a third 2 miles in a north-east by east direction from it.

Doshakiya is a small low island about 6 miles eastward of Tedkar.

Chart 8d, Red sea, sheet 4.

Sharbein (*Lat. 18° 41′ N., Long. 40° 37′ E.*) is a small low sand and coral island, with a few bushes.

CAUTION.—No channel.—From the northern end of the Farisan bank to Sharbein the whole area is occupied by dangerous patches with intricate deep-water passages between them, but no known navigable channel across the bank.

Abu Sayal.—At 5 miles eastward from Sharbein island is the northern end of Abu Sayal, a narrow reef which breaks, being about 5 miles long, north and south. Eastward of Abu Sayal, about 6 or 7 miles distant, are Ablo island, Abu Musha shoals, and other reefs.

Abu Kulúr is a narrow breaking reef about 3 miles long north-west and south-east, its north-western end about 2 miles south-westward from Sharbein.

Abu Dahra island is 13½ miles south-eastward from Sharbein, and 4½ miles eastward from it is Jebara island. Both Abu Dahra and Jebara are small and surrounded with shoals and rocky dangers which preclude the possibility of a passage.

Dorish (*Lat. 18° 30′ N., Long. 50° 10′ E.*) is a low sandy island covered with bushes, its base being a coral reef 9 miles west-south-west from Abu Dahra.

The islands Jebel Sabaya and Jezírat Kutna, eastward of Dorish, have been already described in connection with the Inner channel.

El Umm, Sabiya, and **Maghabiya** are three small low islands of coral and sand, having no bottom at 50 to 80 fathoms in their vicinity. They are from 14 to 16 miles southward of Dorish, and near the western edge of the bank at this part. North-eastward of these islands, a low sandbank and two reefs were seen from the masthead by the surveyors, and beyond them nothing but shoals.

El Hala is a sandbank south-south-west about 1½ miles from Maghabiya island.

Mafsubber is a small island surrounded by reef, 10 miles eastward of El Hala; a small reef lies 2½ miles west-south-westward from Mafsubber island.

General charts 8c and 2523.

Chart 8d, Red sea, sheet 4. Var. 2° W.

Shab Ali is a long breaking reef 11 miles south-eastward from Sabiya island. Several patches are in its neighbourhood, as charted.

Dahret Meraya (*Central rocky patch, Lat. 18° 3′ N., Long. 40° 59′ E.*).—About 6 miles in a south-easterly direction from the southern end of Shab Ali are these two small sandy islands. The eastern one is surrounded by a reef and there is a rocky patch between them. There are also patches of rocks southward of both, and 4 miles south-westward from the westernmost is a bank with several shallow sharp pointed rocks with deep water between them, and no bottom at 50 fathoms close to the western side of the bank. At 6 miles eastward from the eastern Dahret Meraya is a rocky shoal about 3 miles long in a south-westerly direction, with 5 fathoms or less water; and both north-west and south-east from it, 2½ miles in each direction, are rocky patches with deep water around them.

Zukak and Dahret Abu Masali islands.—From the western Dahret Meraya island, Zukak bears W. by N. 9 miles, and 3 miles south-eastward from Zukak is Dahret Abu Masali. Both are small dry sandbanks, Zukak being the largest; both are low and without a bush on them in 1834. Shoals near it as charted.

Shab Maras.—Between the last-named two islands is the northern part of Shab Maras, on which the sea breaks; from thence it extends 8 or 9 miles southward, and is from 5 to 8 cables wide; the southern end breaks and has 15 fathoms close to its eastern side.

Rocky shoals.—Westward and south-westward from the breakers on the southern end of Shab Maras, are six or more rocky patches, near the western edge of Farisan bank, as charted, all steep-to. Another patch lies 5 miles southward of the same breakers.

Shab Rabid.—About one mile north-eastward from Shab Maras are the two small breaking patches, Shab Rabid.

Dahret Simer (*Centre, Lat. 17° 51′ N., Long. 41° 8′ E.*), 20 miles south-eastward of Abu Masali island, is an island surrounded by reef with 7 fathoms close to the northward of it. At 2½ miles south-westward from it is a rocky one-fathom shoal 2 miles long, and 1½ miles north-westward of the island is a similar one-fathom shoal. West-south-west 9 miles from Dahret Simer is a rocky shoal; also, northward of the island, at 1½ miles, and at 4 miles, from it are shoals, having deep water between all of them. For others in the locality, *see* the chart.

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 2° W.

Wasaliyat islands (*North islet, Lat. 17° 42′ N., Long. 40° 55′ E.*).—About 15 miles south-eastward from Dahret Simer is the northern Wasaliyat island; the other lies south one mile from it, the two islands occupying a space of 2½ miles; both are low, sandy, and on a coral bank 4 miles long and nearly 2 miles wide. These are the first islands met with near the outer edge of the reef northward of Shab Farisan.

Shab el Juma.—About 5½ miles south-westward from South Wasaliyat island is this rocky patch, and 3 miles southward from the same island is a 2-fathoms patch, with 23 fathoms between. Shab el Juma is 5 miles within the western edge of the Farisân bank.

Rocky patches.—West 5 miles from North Wasaliyat island is a rocky patch. Between south and south-east from South Wasaliyat, and from 14 to 20 miles distant, are clusters of rocky patches. Eastward and south-eastward of these are other shoal patches; their positions are best understood by reference to the chart.

Matrahein island (*Lat. 17° 9′ N., Long. 41° 34′ E.*).—This small rocky island is one of the out-lying islets of the group of which the Farisan islands form the centre. Eastward and southward of it are numerous patches, as charted.

Dahret Matrahein, 7 miles south-westward of Matrahein, is a small rocky island encircled by reef.

SHAB FARISAN, on the western side of the Farisan bank and fronting the Farisan group of islands, is an extensive rocky bank about 53 miles long in a south-easterly direction, including Marrak island and the shoal on which it stands at what is considered its south-eastern extreme, and it has a general width of 10 miles.

There are numerous islands and many shallow patches on this bank; those near the north-western end are presently described, but the others will be more conveniently referred to in the general description of Farisan and its adjacent islands and shoals in the following pages. No safe channel is known across Shab Farisan, but a deep-water channel exists between it and the islands, varying in width from 1½ to 5 miles, which may be entered at either end of the bank.

Seil Makawa (*Lat. 16° 58′ N., Long. 41° 21′ E.*), 10 miles west-south-westward from Dahret Matrahein, is surrounded by a shallow bank and has several rocks north-eastward of it. It is the northernmost island on Shab Farisan, and is about

Chart 8d, Red sea, sheet 4. Var. 2° W.

3½ miles from either edge of the bank, and 6 or 7 miles from its north-western extreme; between it and that extreme are some rocky patches.

Dhi Dhahaya and Hanish islands, also on Shab Farisan, are close together, about 5 miles south-eastward of Seil Makawa; both are low and sandy.

Khaima island, east-south-east, 5 miles from Dahret Matrahein, is a low triangular island of sand and coral one mile wide, surrounded by five small islands. They are all on one coral reef which is connected with the bank running westward from the northern end of Farisan Seghir.

Jebel Momed island, 11 miles eastward of Dahret Matrahein, is 2 miles long and one mile wide; on the eastern part is a high wedge-shaped hill; the other parts are low ground consisting of sand and coral. The island is nearly surrounded by a gut of deep water of from 15 to 25 fathoms, mud. A bank, with from 3 to 4 fathoms, extends off its northern side, and 2½ miles eastward from the island is a 2-fathoms patch.

Jezírat Disan (*Lat. 16° 56′ N., Long. 41° 37′ E.*).—About 3 miles south-south-eastward from Khaima is the northern point of Jezírat Disan, with an islet close off it and separated from Disan by a deep channel. On the southern part of Disan is the high hummock known as Jebel Disan. The island is of angular form, about 13 miles in circumference, and is generally flat, rising gradually towards the centre. The south-eastern part of Jezírat Disan is connected by a shallow bank with Ras Farisan, the north-western point of Farisan Kebir. The banks off the eastern side of the island have some shallow rocks, but the other sides have deep water.

On the southern side of Jezírat Disan are the remains of a village consisting of about a hundred houses built of rough stones without cement; and, near it, a cemetery containing about a thousand Mussulman graves, and a tomb enclosed by a wall. This place is said to have been inhabited up to the year 1833. Neither wood nor water were found by the surveyors shortly after that date.

Sarso Islands.—About 4 miles south-westward from Jezírat Disan, and lying parallel with each other, are these two narrow islands, which from their north-western ends, extend about 5½ miles in a south-easterly direction, separated from each other by a narrow channel and the eastern island being named Sindi Sarso; they are of coral formation, the western island about half a mile wide; the eastern, half that width. Both

Chart 8d, Red sea, sheet 4. Var. 2° W.

are of considerable height, Sarso being 160 feet above the level of the sea, with sharp points of coral showing above its surface. These islands are on the eastern edge of Shab Farisan, which extends about 9 miles westward and 17 or 18 miles north-westward from them.

The channel between the Sarso islands has from 14 to 20 fathoms in the middle, but is narrow and blocked at the south eastern end by small islands and shoal water. It affords good protection from southerly winds for small craft but, with northerly winds, a sailing vessel would have some difficulty in getting out.

Three small sandy islets lie south-westward of Sarso. The water is very shoal in their neighbourhood.

THE FARISAN ISLANDS, lying between the parallels 16° 54½′ and 16° 36′ N., and the meridians 41° 41′ and 42° 8′ E., are the largest islands on the eastern side of the Red sea; they lie westward of Ras Turfa and of Gizan on the mainland, and from them is named the vast bank extending a distance of about 320 miles parallel with the eastern coast and dividing the central track through the Red sea from the narrow Inner channel on its eastern side. These islands are between one quarter and one third of this distance from the south-eastern end of the bank. They are two in number, but for all practical purposes form but one island, being connected by a sandy spit so shallow that camels frequently pass from one island to the other.

On the eastern side of this spit is Khor Hasayif opening to the north-eastward; and on the western side, Khor Bakara opening to the north-westward. They are of very irregular shape and will be best understood by consulting the chart.

The south-western island is Farisan Kebir, 31 miles long, north-west and south-east, and the north-eastern island is Farisan Seghir, 18 miles long, and lying partly in a bight of the other. Although their united width is only 12 miles, from the irregularity of their form they measure 130 miles round their coast-line.

The Farisan islands are of considerable height, interspersed with plains and valleys. The hills are of coral rock, the most remarkable being Jebel Kasr, a small round hill eastward of Tibta bay on the largest island Farisan Kabir. Remarkable bluff, south-west of Jebel Kasr, is of wedge shape on some bearings, and, from the southward, shows as a hummock with a peak in the centre. The north-western part of Farisan Kebir is high and rocky.

Jebel Safah is a high part of the smaller island and had a tree on its summit; it lies south-westward of Seil Abadho.

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 2° W.

Anchorage.—The best anchorage and most easily accessible from the sea is apparently in Khor Kumh, south side of Farisan Kebir, and described on p. 381.

Khor Bakara (*Entrance, Lat. 16° 54′ N., Long. 41° 44′ E.*).—East 5 miles from Ras Farisan is the north-western extreme of Farisan Seghir, with the small village of Keftib on its highest part. Between these points is the entrance of Khor Bakara, the inlet between the two Farisan islands, which extends about 16 miles to the south-eastward. The approach to this khor is between Khaima island and Jezírat Disan and is deep.

Depths.—The depths are from 4 to 8 fathoms, in the inner part of the khor; the outer part has deep water, but in the narrowest part, about 5 miles within the entrance, there appears to be as little as 3 fathoms. It is not advisable for sailing vessels to run far up the khor, as some parts are so narrow that they would have to warp a considerable way out against a north-westerly wind.

Anchorage.—Shoal.—The bank connecting Jezírat Disan with Ras Farisan extends 4 or 5 miles within and on both sides of the point; on the edge of this, a vessel may anchor in from 16 to 20 fathoms, 1½ or 2 miles eastward of the point, but, at 2½ miles eastward of Ras Farisan, and on the edge of the bank, is a small 3-foot patch, to which vessels seeking an anchorage or entering the khor must give a berth.

About 4½ miles south-eastward of the point is the village of Sayal. Just within the narrowest part of the khor on the western side, and close to the beach, are two or three wells of good water.

Triangle island.—About 3 miles south-westward from Ras Rasib, the north extreme of Farisan Seghir, is a triangular island 5 or 6 miles in circumference, standing on the southern edge of the bank extending westward from Ras Rasib to Khaima island. Several low coral islets lie west of it. On the southern edge of this bank, and 4 miles westward of Triangle island, is a one-fathom patch.

Jezírat Akbein (*Lat. 17° 5′ N., Long. 41° 52′ E.*).—A bank extends eastward from Farisan Seghir, including Seil Abadho within its limits, and from thence stretches away in a north-westerly direction for nearly 18 miles; it consists almost entirely of shoal water and groups of small rocky islets.

Jezírat Akbein, the largest of these, is a narrow strip half a mile wide and a mile long, with two small isles off its northern

Chart 8d, Red sea, sheet 4. Var. 2° W.

end and one on its eastern side. The bank extends 7 or 8 miles north-westward of it, with depths of 3 to 10 fathoms. Between this bank and North Ghorab is a deep-water channel 4 miles wide.

Seil Abadho and **Dhabik island.**—Seil Abadho is 7 miles south-eastward of Jezírat Akbein, and Dhabik, 13½ miles in a more southerly direction. Both are small round coral rocks from 10 to 20 feet high, mushroom shaped. They are sometimes called Pie islands.

Plan on sheet 14, Farisan island anchorages.

One mile south-eastward of Dhabik is a 2-fathoms patch, and west-south-west 3½ miles from the same island is a shallow patch, with another with 4 fathoms half an mile south-east of it.

KHOR SEGHIR (*Lat. 16° 50′ N., Long. 41° 58′ E.*), on the eastern side of Farisan Seghir, is westward of Mandhakh island, and has its entrance along the northern side of that island. This is a good harbour, opening out from the entrance channel into a basin, 2¾ miles long, east and west, by 1½ miles wide, with depths of from 9 to 12 fathoms, and perfectly sheltered from all winds and sea. There is a small village and a grove of date trees on its western and northern sides, in which are many wells of good water. The houses are small and built of coral, but are mostly in ruins. No supplies except water can be obtained, and this is said to be scarce in the hot season.

Entrance.—Depths.—The entrance to Khor Seghir is bounded on the southern side by Mandhakh island, and on the northern side by five small islands on the edge of the shore reef on that side, off the westernmost of which is a rocky spit extending 5 cables south-westward into the basin, which must be avoided. Abreast of the eastern end of Mandhakh the entrance channel is 8 cables wide, and the depth in mid-channel 19 fathoms; from thence, the channel narrows to 2 cables abreast the western end of Mandhakh, where the depth is 6 fathoms, but immediately within it increases to 11 and 13 fathoms.

The best approach is apparently on a line joining Dhabik island and the hill on Mandhakh, north-east and south-west, keeping a good lookout aloft and passing 2 or 3 cables off Mandhakh island reef, and through the fairway of the narrows. Having entered the basin and cleared the spit westward of the western islet before referred to, steer up about west-north-west to the anchorage, and bring up off the grove of trees in about 12 fathoms, mud.

General chart 2523.

Plan on sheet 14, Farisan island anchorage. Var. 2° W.

Mandhakh Island separates Khor Seghir from Khor Hasáyif. It is nearly 3 miles long east and west, and one mile wide at the eastern end, but tapering towards the western end, where it is only half a mile wide. It is a high coral island standing on the northern edge of the shore reef. On its eastern, western, and northern sides the reef extends but a short distance from the island.

Jebel Katah spit extends 4 miles northward from Jebel Katah, and there are many rocky patches eastward and north-west of it as shown on the plan; and also extending northward of Abdulad islands. The highest part of Mandhakh bearing S.W. leads clear of all these dangers. The northern islet at the northern side of the entrance to Khor Seghir bears W. by S. 3½ miles from the outer end of the rocky spit.

Khor Hasáyif (*Entrance, Lat. 16° 51′ N., Long. 42° 0′ E.*). Southward of Mandhakh is Khor Hasáyif, receding about 8 miles into Farisan Kebir. The entrance is between the eastern end of Mandhakh and the reef extending from Jebel Katah, on which are the two islets Seil Sharra Seghir and Seil Sharra Kebir. The entrance is 3 cables wide abreast the south-eastern point of Mandhakh, and, from thence inwards, the channel has from 5 to 8 fathoms water, but is narrow and encumbered with shoal patches. Some rocky islands lie on the western side, on the shore reef.

The khor opens out to a width of 6 or 7 cables farther in towards the head, but is tortuous. At 2½ miles from the head, anchorage may be found in 7 or 8 fathoms, with good swinging room.

Abdulad islands.—Jebel Abdulad is a small rocky island 9 miles eastward of Mandhakh island and surrounded by a group of smaller islands; it may easily be distinguished by a knob or remarkable bluff at its southern end. This island and group are on a bank extending eastward and northward from the neighbourhood of Khor Farisan, and which, after embracing the Maraba islands, and others, forms two tongues, one continuing in a north-easterly direction to a distance of 8 miles from Khor Farisan; the other, on which are the Abdulad islands, turning to the north-westward and extending in that direction about 3 miles beyond the islands, with many dangerous rocky patches.

Chart 8d, Red sea, sheet 4.

Maraba islands.—Jebel Maraba island is about 4 miles southward of Jebel Abdulad, and near a projecting point of Farisan Kebir; it is about half a mile long, rocky, and the

Chart 8d, Red sea, sheet 4. Var. 2° W.

highest island in this neighbourhood. It has a flat top or hummock, is surrounded by a group of small low islands, and appears from the northward as if forming part of Farisan island.

Komari island and Channel (*Lat. 16° 39′ N., Long. 42° 8′ E.*).—About midway between the south-eastern point of Farisan Kebir and Maraba island, and close to the shore of Farisan, is Komari island; it lies on the western side of the Komari channel through which vessels may pass from Gizan to the south-eastward, and the contrary. At 5 cables eastward of Komari is a 2-fathoms patch, and farther eastward are three other patches, south-eastward of Hafer island, and lying across the entrance of the channel, which, throughout, is about 2 miles wide. The shoals are numerous in this neighbourhood and about Farisan island, and the eye must be the principal guide to a vessel entering either way. The surveyors seldom had much difficulty in seeing the reefs.

Vessels having occasion to enter this channel from the south-westward must avoid a bank extending 2½ miles southward from the south-eastern point of Farisan Kebir, with from 3 to 2 fathoms on its outer part; and also the little island Hindiya, 2 miles eastward of this bank. In the fairway, at about 2 miles northward of Hindiya, is a rocky patch having 10 fathoms around it on its edge. One mile southward of Hindiya is an islet surrounded by a shoal.

Hafer island.—About 2 miles north-eastward of Komari island is Hafer, one of a cluster of small rocky islets on the edge of the rocky bank which forms the northern side of Komari channel. The north-eastern islet of this cluster is Abu Shuri. About 5 cables north-eastward of it is a bank of rocks and sand, with 3 fathoms; the main bank extends nearly 4 miles north-eastward from Abu Shuri, is 1½ miles wide towards its outer end, and has from 4 to 9 fathoms.

Kulam island (*Lat. 16° 36′ N., Long. 42° 12′ E.*).—East 3½ miles from the south-eastern point of Farisan is Kulam island, with several small islets and rocks southward, westward, and northward of it, at distances of 1½, 2, and 3 miles, and all on the bank forming the eastern and southern sides of the Komari channel.

FARISAN BANK, westward edge continued from p. 375, Sarso islands.

Umm al Bisran (*Lat. 16° 48′ N., Long. 48° 41′ E.*).—About 6 miles eastward from the south-eastern end of Sarso is the island Umm al Bisran, about 5 miles round

Chart 8c, Red sea, sheet 4. Var. 2° W.

and rather high, but with a valley in the centre into which the sea-water flows; it abounds with wood but there is no fresh water. It is about a mile distant from the north-western side of Farisan Kebir, abreast of Jebel Sayal; and extending from 1½ to 2½ miles north-westward from it is a bank with from one to 2 fathoms water. In the channel between it and Farisan are depths of 40 fathoms.

Za-l-Fif island (*Centre, Lat. 16° 11′ N., Long. 41° 43′ E.*).—Nearly 3 miles southward of Umm al Bisran is the northern part of Za-l-fif, which from thence extends about 7½ miles in an east-south-easterly direction, and is 2 miles wide. The land is high, and deep coves run up into the central part of the island from both ends; here fresh water may be procured, but with some difficulty; wood may also be cut, and antelopes are to be found.

Channels.—Za-l-fif is on the same bank as Umm al Bisran and the shoal northward of it, which bank, extending 17½ miles south-eastward from Za-l-fif, includes Dumusk and Kumh islands, presently described, within its boundaries. There is a deep channel from 2½ to 4 miles wide between this bank and Farisan, and also a deep channel of less width between it and Shab Farisan, the outer bank south-westward of Za-l-fif, and on Shab Farisan is a chain of low sandy islands following the direction of the bank, with very shallow water about them.

Selwán island.—About 1½ miles south-eastward from Za-l-fif, and on the eastern edge of the same bank, is Selwán island, about 2 miles long, high, and of coral formation.

Kumh Island (*Lat. 16° 38′ N., Long. 41° 58′ E.*).—At 7 miles eastward of Selwán is Kumh island, with three high coral islands between them on the same bank.

Kumh island is circular, and 9 miles in circumference, with a small khor on its southern side, capable of sheltering a small vessel.

A rocky spit extends nearly a mile off the northern end of the island, with 9 fathoms close to, and less water towards the Farisan shore. This island is of considerable height on its southern side, and has a remarkable sandhill on its northern end, eastward of which is a small fishing village. The Turkish government erected a white-washed coal store near the northern point; it is 130 yards long, 40 yards wide, and 20 feet high. In 1905, it had not been roofed and had apparently never been used; in fact, the northern shore of Kumh island being fringed by an extensive reef, over which only light boats can pass, a jetty about 250 yards long would be required to make the coal store available.

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 2° W.

There are some wells of brackish water on the island, but no cattle or supplies.

KHOR KUMH.—Northward of Kumh island is Khor Kumh, with a large area suitable for anchorage and protected from all winds. It is 8 miles in length, east and west, including Tibta bay, at its eastern end, and at the narrowest part between the Farisan shore and Kumh island is 1½ miles wide, the same width prevailing between the northern end of the rocky spit extending from the northern side of Kumh and the shore of Farisan.

Depths.—Buoy.—The deepest water is in the two entrances to the bay on either side of Kumh island, where there are from 20 to 23 fathoms; elsewhere, there are from 7 to 13 fathoms, except on the north-eastern side of Kumh where, in the centre, there are 18 fathoms. In the eastern entrance, the western side is marked by a buoy at the edge of the fringing reef of Kumh island, opposite it, under Remarkable bluff, a beacon was formerly erected to mark the eastern side but it has disappeared.

At the north-eastern part of the khor is a well of fresh water, with, however, but a very scanty supply. Farisan village is about 2 miles northward of it.

Tibta bay is in this part of Khor Kumh and affords anchorage for boats; a small wooden wharf was built here many years ago; when seen by the officers of H.M.S. *Perseus*, in 1905, it was rapidly falling to decay; a pile of 40 or 50 tons of coal was then lying near this wharf and had apparently been there for years. Jebel Kasr bearing E. ¾ S. is the leading mark for the small harbour.

Directions.—Vessels from the southward having passed about 4 miles eastward of Dohrab island should steer to pass about midway between Umm-el-Zahil and Dumsuk; continue this course until within 2 miles of the eastern High Coral island, then alter course to the eastward to pass between Dumsuk and Kumh, but keeping nearest to the Kumh island shore. The chart gives no soundings near Kumh, and apparently there is not more than 4 or 5 fathoms. Remarkable bluff bearing N. 50° E. is given as an alternative line across this flat, and it leads about midway between the islands. Umm-el-Zahil and Mahama island northward of it are easily seen, as is also the bluff, which is the easternmost of the sandhills seen in the approach.

When past the south-eastern point of Kumh island, haul to the northward through the eastern entrance, leaving the buoy on the port hand, and anchor within as convenient.

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 2° W.

According to the chart, the deepest approach is that eastward of Dumsuk running straight for that island from about 4 miles eastward of Dohrab until within about 2 miles of it, thence passing about a mile east of it and to the harbour.

There is said to be no channel round the western side of Kumh, but there would appear to be a very direct entrance through the western channel by passing between the two south-easternmost High coral islands.

Anchorage.—Of the two anchorages, that in Tibta bay is said to be most used, being closer to the villages of Farisan. A good berth in Khor Kumh is in 8 fathoms, about one mile from the island with the coal store bearing S. 28° W.

Dumsuk island (*Lat. 16° 33′ N., Long. 42° 0′ E.*).—Nearly 3 miles southward of Kumh, and on the same bank, is Dumsuk island. It is high, about 7 miles in circumference, with a khor having depths of from 15 to 20 fathoms, mud, penetrating the island on its northern side and nearly dividing it into two. No fresh water can be obtained on Dumsuk island, but there are antelopes.

Shoal water extends 7 or 8 cables both south-eastward and north-westward of Dumsuk, and southward of the island are two circular banks in the centre of the deep channel; the least water found on them is 6 fathoms, sand and rocks, but there are charted patches of from less than 6 feet to 3 fathoms both eastward and southward of these banks.

Mahama and Umm-el-Zahil islands.—About 6 miles south-westward from Dumsuk are the two little islands Umm-el-Zahil and Mahama, before mentioned, on, and near the eastern edge of Shab Farisan; they are about a mile apart, with a depth of 6 fathoms between them.

Marrak and Towasela islands.—At 10 miles south-westward of Dumsuk is Marrak, and 2 miles north-westward from the latter is the little island Towasela, both standing on a reef extending 2 miles southward and westward of Marrak and one mile eastward of it, including on it another little islet northward of Marrak.

Channel.—The reef on which these islands stand forms the south-eastern end of Shab Farisan, across which no channel exists by which a vessel should attempt to pass anywhere between Marrak and the north-western extreme of the shab, as has been frequently remarked. Immediately southward of Marrak, however, is a channel 2½ miles wide, with from 11 to 17 fathoms, between the reefs surrounding Marrak and Dohrab island.

General charts 8d and 2523.

Chart 8d, Red sea, sheet 4. Var. 2° W.

Dohrab Island.—Beacons.—(*Lat. 16° 19′ N., Long. 41° 54′ E.*)—Dohrab is a low and sandy island of triangular form with a small islet close to its north-eastern side; it is nearly 2 miles long north and south, and is surrounded by a reef nearly 2 miles wide, with from 4 to 14 fathoms close to. Two beacons stand on Dohrab; the largest, 91 feet high, is erected near the centre of the island; the other, 26 feet high, stands near its south-eastern point. From the south eastward the beacons are in line when bearing N. 56° W. At a distance of 7 miles south-south-west from Dohrab is a 6-fathoms shoal.

Simer island.—About 10 miles east-south-eastward from Dumsuk is Simer island, the third islet of the same name on the Farisan bank; it is small, low and sandy, with a reef on its northern side. About 2 miles southward of Simer is a rocky patch.

Dahret Simer (*Lat. 16° 29′ N., Long. 42° 14′ E.*), also the second islet of its name on the Farisan bank, is a low sand and coral islet, about a mile long, surrounded by a reef which extends 1½ miles to the south-eastward, with a depth of only one fathom; it lies 2½ miles south-eastward from Simer, and 3½ miles north-eastward from Remein island. A 3-fathoms patch lies 2 miles northward of Dahret Simer on the edge of the bank, across which there is no passage southward of Mazakiff island, about to be described.

At 3 miles northward from Dahret Simer, on the same bank, is a cluster of rocks, about a mile in extent, with from 7 to 10 fathoms on its southern and western sides.

Mazakiff, 6 miles north-eastward of Dahret Simer, and on the same shallow reef, is about a mile long and 5 cables wide. Westward of these islands is a channel, with not less than 7 fathoms, leading in a north-north-easterly direction. About 4 miles from Mazakiff, in a similar direction, is the southern end of a shallow patch extending northward more than a mile to near the end of the bank. The eastern edge of this bank is from 15 to 19 miles from the mainland, and there are depths of 13 to 30 fathoms near it.

Remein island, 4½ miles southward of Simer, is about 1½ miles long and shaped something lie a hatchet with the haft to the north-west, the extreme of which is the highest part; the island is principally composed of sand, and is surrounded by a reef.

Maran, Rafa Berri, and Berri islands.—These islands are situated on the same bank as Remein island. Maran

Chart 8d, Red sea, sheet 4. Var. 2° W.

island is surrounded by a reef and with 20 fathoms southward of it. Rafa Berri, the westernmost of the three islands, is about 3 miles long, north and south, of irregular shape, and about a mile wide. Berri is about 3½ miles south-south-west from Maran and 1½ miles eastward of Rafa Berri, lying parallel with, and of similar length and breadth to, the latter; also with a small islet and some rocks between their southern ends. Rafa Berri and Berri islands, being low and sandy, are not so conspicuous as the dark and rocky islands in their vicinity.

Seil Ruba, 2 miles eastward from Maran, is about a mile long, east and west. It apparently lies in a clear channel leading from sea southward of the Berri islands into the Inner channel passing on either side of Seil Siya.

Seil Siya (*Lat. 16° 21′ N., Long. 42° 27′ E.*) lies 8 miles eastward of Seil Ruba, is a small low sandy island, with another small islet just northward of it, the whole surrounded by a reef with from 2 to 8 fathoms water, extending about 2½ miles, north and south; a channel with from 25 to 12 fathoms surrounds this reef.

North 7 miles from Seil Siya is the southern end of a one-fathom patch about about a mile wide and extending about 3 miles northward, with deep water close to it all round.

Dhu Dafr and Zuhrat islands are on a sand and coral bank shaped like a man's leg and foot, 3 miles westward of Seil Siya. The depth between the two Zuhrat islands is from 2 to 4 fathoms, and northward of them, from 6 to 13 fathoms. Dhu Dafr is at the toe of the foot, 2 miles westward of the southern Zuhrat island. Eastward of the middle part of the bank are three rocky patches, and between them and the reef northward of Seil Siya is another rocky patch.

Rokáda island.—About 3 miles southward of Seil Siya is Rokáda, with two other small islands southward of it, one distant 5 cables, the other 2 miles. At 3 miles westward of Rokáda is El Onsurat island, about 1½ miles long and of an irregular shape; and upwards of a mile in a west-north-westerly direction from it is a sandbank, 1½ miles long, east and west; this is near the northern part of the inner bank.

Simer island (*Lat. 16° 17′ N., Long. 42° 17′ E.*), the third island of that name on the Farisan bank, is 3 miles eastward of Berri, and is separated from it by the channel before mentioned. Simer is of triangular shape, about 8 miles in circumference, and is at the western edge of an extensive bank. A mile northward of it is an island about one mile in extent. On the western side of Simer is a small village where brackish water may be obtained; antelopes were plentiful.

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 2° W.

Erdheim, a mile eastward of Simer, is a long narrow island and rather high. Between Simer and Erdheim is another small island.

Bank.—Simer and Erdhein, El Onsurat, and Rokáda, already described, with Dokeila and many others, also many shallow reefs scattered about, all lie on one extensive bank, on which the depths are under 20 fathoms. There is no passage over it.

Dokeila islands, 4 miles eastward of Erdhein, are two high rocky islands, of which the south-eastern, and smallest, is triangular, nearly 1½ miles long, and three-quarters of a mile at its greatest width. The larger island has more of a horse-shoe shape, is upwards of 5 miles in circumference, and has foul ground extending one mile from its south-western point. On this island is a small village, a mosque, and some wells of brackish water.

El Bodhi (North) is a high and remarkable rock 1½ miles south-eastward from the south-eastern Dokeila island; it has five small rocky islets close to, on its northern and western sides.

Jebel Jink and **Maflakein** are two small, high, and rocky islands on a bank of shallow water, south-westward of the Dokeile islands.

Fasht island (*Lat. 16° 11′ N., Long. 42° 20′ E.*) lies south-westward of those last described; it is 2½ miles long, north and south, by one mile wide near its southern end, and is of good height. There is a small fishing village with a mosque in the centre of it, and near the village are some wells of brackish water. On the southern part of the island is a well of good water, but it is difficult of access, the landing-place being rocky.

Sana island.—About west-south-west 5 miles from Fasht is Sana island, on an extreme western point of the inner bank; it has a low white sandy appearance and is about 1½ miles long, north-west and south-east, with two bights on its north-eastern side, and a small bay on its western side.

Majur.—About east-south-east 7 miles from Sana, and on the same bank, is Majur island, about 1½ miles long, with 3 fathoms close to its north-eastern side; and, between it and Sana is a 2-fathoms patch.

Bank.—Nearly 8 miles south-south-eastward from Sana, on the parallel of 16° N., and near the western edge of the inner bank, is the western end of a shoal of from one to 3 fathoms, which extends about 3½ miles eastward and then turns to the

General chart 2523.

Chart 8d, Red sea, sheet 4. Var. 2° W.

northward for about the same distance, its northern end approaching to within one mile of Majur island. Several 3-fathoms patches lie just within the western edge of the inner bank in this neighbourhood, with 40 or 50 fathoms close to westward of them.

Zoha and Zajj islands.—East-south-east 9 miles from Majur are the low sandy islands Zoha and Zajj on an extensive bank with irregular depths. One mile northward of Zajj is a 2-fathoms patch, and 3½ miles in the same direction from it, with deep water intervening, a one-fathom bank.

Rakl and Jurab islands.—South-eastward 3 or 4 miles from Zoha are Rakl and Jurab islands, two low sandy cays with reefs around them and extending a mile westward from Rakl, whilst at one mile, south-westward from Jurab, there is also a small rocky patch. Jurab is about 9 miles distant from the mainland, and from one to 2 miles eastward of it is Nasib islet and shoal forming the western boundary of the Inner channel before described.

Loban island (*Lat. 15° 52′ N., Long. 42° 16′ E.*), lies south 14½ miles from Sana island, and is on the inner edge of the outer bank; it consists of coral rock with an upper layer of soft earth and sand. The reef on which it stands extends 2½ cables from the northern end, and nearly 2 miles from the southern end, with 12 fathoms close to, and on the bank, 4½ miles southward of Loban is a 4-fathoms patch.

Berri islands.—At 9½ miles eastward of Loban island is the western and nearest of the two small Berri islands, the second pair of islands of the same name on these banks; they are small and low, and had a fisherman's hut on the northern end of the north-eastern islet; each is surrounded by a reef.

Tulowein island.—About 11 miles south-eastward from Loban, and 3 miles northward of the centre of Entufash, is the low sandy island Tulowein, with a little rise on its eastern part and surrounded by a reef extending nearly one mile from it.

Chart 143, Jebel Teir to Perim.

Entufash Island (*Centre, Lat. 15° 42′ N., Long. 42° 25′ E.*), is a sandy plain 6 miles long east and west, about 1½ miles wide at its centre and 2½ miles at its western end, where it rises to between 50 and 60 feet in height, the south-western point being of a brownish colour, cliffy, and about 20 feet high.

General chart 2523.

Chart 143, Jebel Teir to Perim. Var. 2° W.

From the north-western point, a reef extends 3 miles in a north-north-westerly direction with 8 fathoms at its extreme. Along the southern side of Entufash the reef extends more than a mile off-shore, and, from the south-western point, 3½ miles with rocky islets at its extreme; there is no safe passage over this reef. From the western end of Entufash, there is an outlet to seaward northward of Kotama island and reef, and another northward of Okban. Antelopes are plentiful on Entufash, but no fresh water has been found; two or three huts are occasionally occupied by turtle fishermen.

Anchorage.—Between Entufash and the small low islets off its eastern end, is good anchorage in 4 or 5 fathoms.

Channels.—Kotama, Entufash, and Bawarid, are on the northern side of a channel leading to Loheiya from seaward.

Kotama Island (*Centre, Lat. 15° 40′ N., Long. 42° 16′ E.*), is about 5 miles west-south-west from Entufash, and 8 miles north-north-west from Okban. It is sandy, about 3½ miles long, north and south, and 1½ miles wide and rather higher than many of these islands, but lower than Entufash; its eastern side shows as a low white cliff. On it may be seen a hut or two, and a small square coral building containing a grave; the island has neither water nor permanent inhabitants.

A reef extends 2 miles northward from the northern point of Kotama; a deep water channel borders its eastern side; the other sides are bordered by banks of sand and coral of irregular depths, for 2 miles off-shore on the western side; southward of the island, they extend upwards of 6 miles in a south-south-westerly direction. These banks form the outer southern extreme of the Farisan bank, as Kamaran islands forms the inner.

Okban island, between Kotama and Kamarn islands, with the adjacent channels, will be found described at page 361.

General charts 8d and 2523.

CHAPTER VIII.

EASTERN SHORE OF RED SEA FROM RAS ISA TO CAPE BAB-EL-MANDEB, AND SOUTH COAST OF ARABIA FROM THENCE TO ADEN.

(From Lat. 15° 13′ N., Long. 42° 32′ E., to Lat. 12° 23′ N., Long. 45° 5′ E.

VARIATION IN 1909.—Decreasing 4′ annually.

Chart 143, Jebel Teir to Perim.

The Coast.—*Continued* from page 363.

Isa bay, the north extreme of which lies within Ras Isa, is about 23 miles in length in a south-west and opposite direction, its southern extreme being Ras Kethib. The 5-fathoms line is 2 miles off shore in places, and the depths at 6 miles off are from 7 to 10 fathoms.

Bank.—In 1903, H.M.S. *Harrier* discovered a bank westward of Isa bay, its northern end about 7 miles southward of the extreme of the land westward of Ras Isa; the bank is about 4 miles long, north and south, with from 7 to 9 fathoms on it, and from 17 fathoms all around, deepening to 28 and 30 fathoms westward of it.

Ras Kethib, 20 miles south-south-eastward from Ras Isa, is the extreme point of a tongue of low land extending northward 4 miles from Ras el Jedir, and forming a bay or inlet on its south-eastern side. Shallow water extends 2¼ miles northward of Ras Kethib with a patch of 2 fathoms nearly a mile beyond, are in the fairway to the bay within. This bay affords protection for small craft during southerly winds. On its eastern side is a low island on a reef extending 1¼ miles offshore.

Shoal water, with depths of less than 5 fathoms, extends nearly 7 miles off the coast between Ras el Jedir and Ras Kethib.

The existence of foul ground, or isolated patches, extending much farther south-westward from Ras el Jedir than previously

Chart 143, Jebel Teir to Perim. Var. 1° 50′ W.

supposed, and lying about 11 miles W. by N. ½ N., from Hodeida, was reported in 1883, by Commander R. Evans, H.M.S. *Lily*. This shoal ground, over which the *Lily* passed in 4¾ fathoms (the bottom, apparently coral, being clearly visible), lies with Ras el Jedir bearing 6 miles. From this position, discoloured water appeared to extend northward about 4 miles, and eastward with a southerly curve to Ras el Jedir. H.M.S. *Melita* passed over a part of this shoal ground in 1895, and found its edge well marked, the water inside the line being a light green. In 1901, H.M.S. *Scout* passed over a portion of this shoal and, although the bottom could be plainly seen in places, no bottom was obtained with the hand lead. It should be given a wide berth.

Plan on sheet 14, Hodeida road.

HODEIDA (*Lat. 14° 47′ N., Long. 42° 54′ E.*).—Hodeida, about 5 miles south-eastward of Ras el Jedir, is a large town with lofty buildings; the north fort and grand mosque minarets are conspicuous marks; the south fort, in ruins, is scarcely visible. The environs of the town are less sterile than the surrounding country, and have some palm groves as well as gardens. In 1897, the population was estimated at over 50,000, but no census has ever been taken.

Anchorage.—Vessels may anchor 2½ miles from the shore in about 4 fathoms, half a mile south-westward of some small patches of reefs in the roads, extending rather over a mile south-west of Fishing point, with the sea gate and little minaret E. by N., and Fishing point N.E. by N. The sea gate on the bearing given, will lead to southward of the patches as far as is prudent. The patches do not always show.

Trade.—Hodeida is one of the coffee ports, and has a considerable bazaar where supplies may be procured. Its trade has suffered considerably of late years through the growth and competition of other small ports such as Loheiya, Medi, Gizan, &c. Hodeida has no wharfage nor any of the usual conveniences of a trading port; the old wooden pier, a very primitive affair, having fallen entirely to decay; and though a more substantial pier has been projected, little or no progress has been made. So exposed is the place, that landing is difficult, and, at times impossible, with the wind between south and west.

The principal exports are coffee, hides and skins, fuller's earth, &c. In 1904, the total value of the exports amounted to 450,665*l.*, or about half of that in former times. The chief imports are cereals, bread-stuff, rice, piece-goods, sugar, silk,

Plan on sheet 14, Hodeida road. Var 1° 50′ W.

condiments, petroleum, &c.; the total value of imports in 1904, was 467,095*l.*

The aggregate tonnage that entered and cleared at Hodeida in 1904 was 88,306 tons, of which 9,589 tons consisted of 527 small sailing coasters, mostly and almost entirely Turkish or native; 78,717 tons were steam tonnage, the steam-vessels being 168 in number, of which 130 were British and 26 Italian, the remaining 12 being either Turkish, Greek, or Russian.

Water.—There is said to be plenty of good water at Hodeida, which the natives will bring off to shipping in their own boats.

Communication.—The steam-vessels of the Khedivial Mail Steamship Company call regularly every fortnight both on their outward and homeward run. Messrs. Cowasjee and Company, of Aden, send a steam-vessel weekly, and sometimes more frequently, with both mails and cargo. Steamers of the Florio-Rubattino, line call about fortnightly. A few other steam vessels, under British and other flags, call at irregular intervals.

Telegraph.—Direct telegraphic communication exists between this place and Sana, Mokha, Kamaran, Medi, and Loheiya. Perim connects Hodeida with the rest of the world.

Climate.—From April to September, 1897, north-easterly and north-westerly winds prevailed, and during the rest of that year strong south-westerly winds blew, and many people at Hodeida suffered from ague and rheumatism. Visitations of cholera are not unknown and the defective sanitary arrangements of the town are such that it is rather surprising it is not more unhealthy.

Chart 143, Jebel Teir to Perim and Plan of Khor Ghuleifaka.

COAST.—**Ras Mujamela** (*Lat. 14° 37′ N., Long. 42° 54′ E.*), is the northern extreme of a sandbank, from 3 to 10 feet high, and formerly connected with the mainland by a narrow strip of sand, about 12 miles long, in a south-south-easterly direction, thus forming Khor Ghuleifaka on its eastern side. The sea has, however, washed an opening through this peninsula into the Khor about 5½ miles southward of the Ras, through which there is reported to be as much as 3 fathoms water.

The water is shoal, with depths generally less than 5 fathoms, for 3 miles westward of Ras Mujamela, and from thence, within a line running roughly parrallel with the shore, for 12 miles, until abreast of the sandhill of Ketf-el-Makhayish, which is about 40 feet in height.

General charts 143, 8d, 8e, and 2523.

Plan, Khor Ghuleifaka, on chart 143. Var. 1° 50′ W.

On the outer part of this shoal bank, in July 1906, the s.s. *Africa* discovered a 1½ fathoms patch nearly 3 miles from the shore, with Ras Mujamela bearing N. 30° E., distant 4½ miles, and the southern extreme of the same sandy island, S. 75° E.

Khor Ghuleifaka.—Ras Mujamela, the north-western point of Khor Ghuleifaka, cannot be seen more than a few miles distant; the best guide, therefore, in approaching the Khor is the bearing of Hodeida, the great mosque minaret of which may be seen 12 or 14 miles distant. The minaret bearing N.E., leads well clear of the shoal ground westward of Ras Mujamela; and with the Ras bearing anywhere between East and S.S.E., or the hill, 100 feet high, eastward of the khor about E. ½ N., the khor may be steered for, but in hazy weather much caution is requisite as shoals are steep-to.

On the mainland, abreast of Ras Mujamela is a sandhill about 100 feet high, and on the coast opposite the southern end of Khor Ghuleifaka is the Ketf-el-Makhayish, a sandhill in the shape of a haycock, about 40 feet high, before-mentioned, which may be distinguished in clear weather when approaching Ras Mujamela from the southward.

Entrance (*Lat. 14° 37′ N., Long. 42° 57′ E.*).—**Depths.**—The entrance to the khor is between the eastern extreme of the low spit extending 2½ miles eastward from the ras, beyond which shoal water, with 9 feet at its extreme, extends at least 5½ cables farther, and the shore bank, extending 1½ miles from the eastern shore and overlapping the spit from the western side. The entrance is narrow and winding, and no more than from 3 to 4 fathoms can be depended on in the best water. Inside, there is extensive and sheltered anchorage ground for small craft in from 3 to 4 fathoms. The khor is thought to be gradually silting up.

Northward of the entrance there is anchorage with shelter from southerly winds in from 4 to 6 fathoms.

Water.—On the eastern side of the khor, abreast of the entrance, is a place called Shurein, near which, at about a mile or more inland, over a beach of soft sand, are some wells of good water.

Tides.—At Ras Mujamela, it is high water, full and change, at about 1h. 10m.; the rise is about 4 feet.

Chart 143, Jebel Teir to Perim.

COAST.—From Ketf-el-Makhayish the coast trends south-south-eastward for 26 miles to Ras Muteina; it consists of low hills backed by mountains; the 5-fathoms contour is 5 miles off

Chart 143, Jebel Teir to Perim. Var. 1° 50′ W.

shore at about midway abreast of Ketf Koreish, and in places rocks are charted near the shore.

Ketf Koreish bluff makes like an island from the southward, and when abreast of it, still appears to be well clear of the land, probably from its being lower and of a darker colour than the coast hills in the neighbourhood. It has a conical summit, and a wedge-shaped piece of land shows up close-to, on its northern side. Though but an indifferent landmark, Ketf Koreish bluff is the best anywhere in the vicinity.

El Gah (*Lat. 14° 15′ N., Long. 43° 4′ E.*), is an open anchorage, and is used as a landing place for slaves in fine weather, the large village of El Gah being about 4 miles inland; the anchorage is just northward of Ketf Koreish bluff. The natives here are well armed.

Mersa el Majalis, a short distance southward of Ketf Koreish bluff, is an excellent boat harbour at the mouth of a small river, protected from southerly winds by a long spit running out in a north-westerly direction from the shore. When visited by H.M.S. *Scout*, in 1902, cattle at 18*s.* and sheep at 3*s.* per head were plentiful, and the natives were friendly. A thick grove of palm trees extends a short distance eastward from the mersa, and detatched clumps of trees, similarly, to the northward. The high reeds growing along the river bank are seen from seaward over the foreshore.

Ras Zebid.—Shoal.—About 6 miles southward of Mersa el Majalis is Ras Zebid, off which is a small shoal on which the sea breaks.

Mersa el Fai-is (*Lat. 14° 8½′ N., Long. 43° 5′ E.*), is about one mile north-eastward of Ras Zebid; it is a small creek the mouth of a stream, and is used by slave dhows for landing their cargoes. The stream is from an excellent spring of fresh water. The rushes and reeds growing about its mouth are easily distinguishable from the anchorage off it, in 4½ fathoms, and there are also some trees and bushes in the Wadi Fai-is, the name by which the locality is known. It would be difficult and even dangerous to attempt watering here, with any surf on the beach.

Shoals.—Northward of Ras Muteina, from one to 2½ miles distant, are three rocky patches, a mile from the shore, on which the sea breaks.

General charts 8e and 2523.

Chart 143, Jebel Teir to Perim. Var. 1° 50′ W.

COAST.—From Ras Muteina to Mokha, distant 41 miles to the southward, the coast-line recedes, forming a slight bay, in which the soundings decrease with regularity towards the shore throughout this space, a depth of 5 fathoms will be found at from 1½ to 2 miles from the land.

Jebel Músa, or the **Three Sisters,** are three pyramidal hills, 6 or 7 miles inland, east-south-eastward of Músa village.

About 14 miles inland of Mokhá is Jebel Nar or Barn, a remarkable piece of high table-land, which, when in line with the mosque at Mokhá, bears E. ½ S.; southward of this and south-eastward of Mokhá is South peak, another remarkable part of the highest land, appearing as if covered with ruins.

Kubbat el Himar (*Lat. 13° 53′ N., Long. 43° 12′ E.*), is a point of land 9 miles south-eastward of Ras Muteina, marked by a small white mosque. About 1½ miles south-eastward of it is the small village of Sahari, somewhat difficult to make out, as it consists of a few brown huts only; the anchorage off it is exposed and bad with southerly winds, but, under favourable circumstances, good water may be procured here.

Khaukha and Músa, are villages, respectively, 7 and 11 miles southward of Kubbat el Himar; Músa may be known by a small white mosque on its point.

Between Sahari and Mokha, besides the two places named, are numerous villages along the coast, all of which have one or two mosques, and, judging from the trees surrounding them, would probably afford a supply of fresh water. One of the largest lies between Sahari and Khaukha; it has a conspicuous three-domed mosque of a brownish colour.

Anchorages.—The depths being regular along this coast, a vessel in want of water may anchor in any convenient depth off the places mentioned as probably supplying water.

Mersa Fejera, a bight in the coast at 7½ miles southward of Músa, affords shelter for boats or very small craft in about 3 fathoms; the coast projects a little, and in some degree serves to break the swell caused by southerly winds.

Half way between it and Mokhá; on the seashore, is Yochtúl mosque.

Plan 1955, Mokhá road.

MOKHÁ, (*Lat. 13° 20′ N., Long. 43° 14′ E.*), lies in a small bay between two low points, about 1¼ miles apart, on each of which are the ruins of a fort. Between the ruins extends the sea-wall, which allows access to the town by a single gate only; in front of the gate is a stone pier or jetty, like the town itself,

Plan 1955, Mokhá road. Var. 1° 50′ W.

in a state of utter decay. The town extends along the shore, is about half a mile square, and, from the sea, in its prosperity must have had an imposing appearance. The houses were originally large, white, and built of stone, but are now in ruins, the only buildings of any importance now standing being the mosques, of which there are several with lofty minarets. The highest, in the eastern part of the town, 118 feet high, is a good landmark. The streets were always very narrow, and in places have become impassable from the débris.

Mokhá no longer holds any position as a trading port, and, presents but few traces of its former condition. In 1824, it contained about 20,000 inhabitants; in 1882, scarcely 1,500 were within its walls; and in 1901, the number was about 400 The coffee plantations, for which it was once celebrated, lie inland about 45 miles from the town, but the trade in that article is now very small. The decline of Mokhá, once the principal seat of commerce in the Red sea, appears to have been coincident with the establishment and rise of Aden as a British port.

The country round Mokhá is an arid sterile plain, without fresh water, the town having been supplied by an aqueduct from the village of Músa, at the foot of the hills, 24 miles to the northward.

Mokhá roads, with a depth of 3½ fathoms, are over a mile westward of the town, with deeper water farther off, and, as there are some shoal patches in the approach, care is required in approaching the anchorage. The principal dangers are the North shoals, with from 10 to 18 feet close to the anchorage, and the South shoals, with a minimum depth of 13 feet, surrounded by from 4 to 6 fathoms water, in the approach from the southward.

The North shoals are at the north-western extreme of the shallow ground stretching from the direction of the light-tower on the site of the old South fort; from their shoalest spot of 10 feet, the North fort, still a fairly conspicuous object, bears N. 71° E. $1\frac{6}{10}$ miles, but many shoal patches of from 15 to 18 feet lie from 1½ cables north-eastward to 3½ cables north-westward of the 10-feet patch.

The South shoals lie about 2 miles south-westward from the North shoals, and the outer 13 feet shoal lies with the high minaret N. 60° E., distant $3\frac{8}{10}$ miles; they cover an extent of nearly a mile, north-west and south-east, with from 13 to 22 feet water; between them and the shoal ground extending off-shore, is a channel, about 7 cables wide, with from 5 to 7 fathoms.

General charts 3180, 143, 8e, and 1523.

Plan 1955, Mokhá road. Var. 1° 50′ W.

About 1½ miles north-westward of the South shoals, there are patches of 28 and 30 feet.

LIGHT.—On the site of the old South fort stands a red iron framework tower, 167 feet high, from which is exhibited, at 171 feet above high water, a *white flashing* light with a *five-seconds* period; the *flash* shows for *one-tenth of a second*, and is visible 19 miles.

Tides.—It is high water, full and change, at Mokhá, at noon; springs rise 4¼ feet. At springs, there is often only one high and one low water in the 24 hours; at neaps, there are two tides in the day, but the times are irregular.

The flood stream sets northward, the ebb southward at from one to 2 knots. The duration of the streams is much affected by the winds. Close inshore, during strong southerly winds, it often happens that the southerly stream sets for 16 hours at a time, and the northerly stream for 6 or 8 hours. In the deep water outside the shoals, a northerly current is permanent during winter and spring.

DIRECTIONS.—From the northward.—Jebel Kateri high bluff, open northward of the high minaret of Mokhá, bearing E. by S. leads about half a mile northward of the North shoals. When the light-tower is in line with the distant sharp peak of Jebel Dubaab, bearing S.E. by S., a vessel may anchor, in about 21 feet, or may steer towards it to be more under the North shoals, anchoring in the same depth with the high minaret about E. ¼ S.

Jebel Kateri is a long wedge-shaped hill terminating in a steep bluff at its northern extreme. *See* view on plan 1955.

From the southward. — In a vessel above 12 feet draught, it is advisable to keep outside the South shoals, south-westward of Mokhá, by not shoaling to less than 11 fathoms, until the North fort bears N.E. by E. ½ E.; then steer for it, until the light-tower bears E. ½ N.; the course should then be altered to N. by E. ½ E. until the high bluff of Jebel Kateri is open northward of the high minaret as before, then it may be steered for, as before directed.

As the tidal streams are from one to 1½ knots, vessels are recommended to moor.

Chart 3180, Straits of Bab-el-Mandeb, &c.

COAST.—From Mokhá, for about 33 miles, until within 9 miles of Cape Bab-el-Mandeb, the coast line is nearly straight in a south-south-easterly direction; it consists of low hills backed by lofty mountains in the distance.

General charts 143, 8e, and 2523.

Chart 3180, Straits of Bab-el-Mandeb, &c. Var. 1° 50′ W.

About 9 miles southward of Zi hill the coast turns south-westward for about 7 miles to the entrance of Sheikh Syed lagoon, at 2 miles beyond which is the termination of the headland of which Ras Bab-el-Mandeb is the central and south-western extreme.

Soundings.—The soundings along this coast are regular, and the lead is a good guide in approaching it. By not standing into less than 12 fathoms a vessel will avoid all dangers near it.

ZI HILL (*Lat. 12° 57½′ N., Long. 43° 25′ E.*) is a small but remarkable wedge-shaped piece of rocky land, 232 feet high, standing close to the beach, at 24 miles southward of Mokhá; there is no other hill like it in the vicinity, the land about it being generally low, with high hills in the interior; it is more conspicuous as seen from the southward than from the northward. Jebel Dubaab, 5 miles north-eastward of Zi hill, is 1,100 feet high.

ZI.—Shoals.—At one mile southward of Zi hill is the village of Zi, or Dubaab, on a rocky point, with a white sandhill, 66 feet high, behind it. The point is fairly steep-to. The coast southward of Zi point, and is fronted by a reef which extends 1¼ miles off at 5 miles southward of this point, thence southward it draws nearer the shore.

Chiltern shoal (*Lat. 12° 53′ N., Long. 43° 25′ E.*).—About 1¼ miles outside the shore reef last described, is a shoal discovered by the s.s *Chiltern*, in 1890; it is 7 or 8 cables long north-west and south-east, and from its shoalest part, 2¼ fathoms, near the centre, Zi hill bears N. ½ E. distant 4½ miles, the nearest part of the shore reef being distant about 1¼ miles. There are depths of 6 to 7 fathoms around it.

Plan 2592, Perim island and Bab-el-Mandeb small strait.

Sheikh Syed, situated about 2 miles north-eastward of Ras Sheikh Seyd, is a lagoon extending about 2¼ miles in a south-easterly direction from its entrance to about half way through the Bab-el-Mandeb peninsula with a breadth varying from about 50 yards at the entrance to nearly a mile near its head. The water off the entrance is shoal, there being 2 fathoms about 4 cables off the mouth. The entrance is almost closed by two banks, which dry at low water, with a narrow 3-feet channel between, and there is less water in the lagoon.

Tides.—At Sheikh Syed lagoon neaps rise 4 feet. In the entrance, the tidal streams run at from 3 to 4 knots.

General charts 143, 8e, and 2523.

Plan 2592, Perim island and Bab-el-Mandeb small Strait. Var. 1° 50′ W.

Ras Sheikh Syed, 1¾ miles south-westward of Sheikh Syed island, is about 15 feet high, and has shoal water extending 3 cables westward of it; there is a good landing-place just southward of the point.

RAS BAB-EL-MANDEB (*Lat. 12° 40½′ N., Long. 43° 28′ E.*), or the Cape of the Gate of Affliction, a prominent headland, wedge-shaped, sloping towards the sea with low land behind it, is the south-western extreme of Arabia, and the north-eastern point of entrance to the Red sea from the Gulf of Aden.

The highest land near the cape, Jebel Manhali, or Quoin hill, is 1½ miles east-north-eastward of the Ras, and is 886 feet high; it is said to be of volcanic formation. From it the land slopes down to the southward and westward, so that eastward of the point several rocky points are formed projecting half a mile beyond the general line of the shore, and between them are small bays affording shelter to small craft during northerly winds. About 2½ miles eastward of the cape is Turba, a square dark hill, 480 feet high, on which are some ruins.

Sheikh Malu, or **Oyster island,** is a small rocky island, 57 feet high, off Ras Bab-el-Mandeb, its western extreme being about 3 cables from the shore, with which its eastern end is connected by a shoal and rocky ledge; north-westward and south-eastward of the island, there is good anchorage for small craft, according to the prevailing wind.

Off its north-western side, shallow water extends about half a mile, to a depth of 5 fathoms. From its south-western and southern sides, shoal water extends about 1½ cables.

Chart 3180, Straits of Bab-el-Mandeb, &c.

Aspect.—About 2 miles north-eastward of Jebel Manhali is Jebel Heikah, a small range of hills extending 3 miles in a north-north-westerly direction, attaining a height of 535 feet, and of irregular outline. The intervening land is low, sandy, and barren, but in the valley a few bushes and patches of grass may occasionally be seen, on which antelopes are found to subsist.

North-eastward of Ras Bab-el-Mandeb, about 15 miles distant, is Jebel Hejar, a range of hills extending about 16 miles eastward in a direction nearly parallel with the southern shore of Arabia; they are of dark aspect, irregular in outline, and, although from 700 to 1,100 feet above the sea, appear low as the sandy plain rises gradually from the sea shore to a height of 400 or 500 feet at their foot.

Jebel Arrar, or **Chimney peaks,** is a remarkable range, or series of ranges, of mountains, from 2,000 to 3,000 feet high,

Chart 3180, Straits of Bab-el-Mandeb, &c. Var. 1° 50′ W.

about 25 miles north-eastward of Ras Bab-el-Mandeb; they extend in a north-west and south-east direction for about 20 miles, have a generally irregular outline of sharp needle-pointed summits, becoming more rounded towards their south-eastern end, and terminating in Barn peak, 1,985 feet high, a very conspicuous square-shaped mountain, with a peak in its centre, and only 10 miles inland from the eastern end of Ghubbet el Haikah in the Gulf of Aden. These mountains are always visible in clear weather when approaching the straits of Bab-el-Mandeb, either from the Red sea or Gulf of Aden; they are bounded northward by a much higher range of more distant mountains.

Straits of Bab-el-Mandeb and Perim island.—For description and directions, *see* pages 276–284.

Charts, Gulf of Aden, 6a and 6b, sheets 1 and 2.

GULF OF ADEN.—General remarks.—Full details of the changes of climate, winds, weather, currents, &c., which may be anticipated on entering the Gulf of Aden from the Red sea are given in Chapter I. of this work.

It is now only necessary to remind the mariner of the marked difference, before mentioned, between the navigation of the Gulf and the Red sea, caused by the entire absence in the former of all central dangers and the general safety of approach to its shores as compared with the latter, the only real dangers in the Gulf of Aden being the reefs off Zeila, on the African shore, and the bank of broken ground off and between Ras al Ara and Ras Kaáu on the Arabian shore.

Chart 3180, Straits of Bab-el-Mandeb, &c.

NORTHERN SHORE.—Ghubbet al Haikah.—The coast from Ras Bab-el-Mandeb trends in a north-easterly direction about 7 miles, when it turns abruptly eastward for about 21 miles to the western part of Ras al Ara, forming Ghubbet al Haikah, which has low sandy shores and affords a convenient and smooth anchorage for sailing-vessels working into the Red sea against the strong north-westerly winds in June and July. A vessel standing into this bay should not approach nearer than 10 fathoms by day, or 14 fathoms by night, to avoid several 2 and 3-fathoms patches, which front the shore to the distance of about one mile in places.

Water.—At Sakiah, in the western part of the bay, is a group of palm trees, and 1½ miles eastward of it is Bir Usaf, where there is a well of good water; judging by the names of places further eastward in the bay, Bir Jiraza, Bir Hajaf, &c., there can be no want of fresh water along this coast; firewood is also abundant.

General charts 8e and 2523.

Chart 3180, Straits of Bab-el-Mandeb, &c. Var. 1° 50′ W.

RAS AL ARA (*Lat. 12° 36′ N., Long. 43° 56′ E.*).—This Ras is the south-western extreme of a projection, 11 miles wide east and west, with the Ghubbet al Haikah on its western side and Khor Omeira on its eastern side. It is a low sandy rounded point, difficult to distinguish at night, and one of the most dangerous points on the coast, being in the direct route of vessels proceeding to or from the Red sea, and having a bank of hard sand extending about 3 miles off-shore southward and south-eastward of it. About 2 miles eastward of Ras al Ara is a slight projection, with a sunken rock close off it and 7 or 8 feet water between it and the shore; this point is the southern extreme of Arabia.

Rock.—A sunken rock lies 1½ miles off shore at 3½ miles south-eastward of the point, within the 5-fathoms contour-line. This rock is steep-to, as is also the shore between it and the point.

Several vessels have been wrecked in this locality, but a too near approach in thick weather may be guarded against by the use of the lead. It is advisable not to approach to a less depth than 15 fathoms by day, in hazy weather, or 20 fathoms by night. The water is often discoloured in this locality.

Anchorage.—There is good anchorage in about 6 fathoms, mud and sand, in the small bay westward of Ras al Ara, affording shelter against the strong winds of the north-east monsoon; the shore around the bay is rather steep. In making for this anchorage from seaward, Ras al Ara is not easily distinguished. Barn peak, bearing between N. by E. and N. ½ E. will lead in; when the conspicuous clump of palms on the point shows out clear of the Jebel Kharaz range, haul to the eastward and anchor with the palms bearing about E.S.E. and a solitary house in the corner of the bay, N. by E. ½ E. in about 6 fathoms.

Water.—There is a supply of fresh water in this bay near a grove of date trees. The natives on this part of the coast should not be trusted.

Khor Omeira (*Entrance, Lat. 12° 38′ N., Long. 44° 7′ E.*).—This remarkable lagoon has its entrance about 10 miles eastward of the southern extreme of Ras al Ara; it is 4 miles long, east and west, by 2 miles wide, and is almost land-locked by a narrow spit of sand projecting from its eastern shore and forming its southern boundary, leaving a narrow entrance with from 3 to 5 feet water at its western end; after entering there are many dry banks and very little increase of depth for the first 2 miles, after which it opens out into a basin with from 3 to 4½ fathoms in its southern part.

General charts 6b, 8e, and 2523.

Chart 3180, Straits of Bab-el-Mandeb, &c. Var. 1° 50′ W.

At high water, the low southern spit, from which shoal water extends nearly a mile to seaward, is nearly covered.

Foul ground with rocky heads extends about 2 miles westward of its entrance, generally breaking. Except at the top of high water, therefore, a boat or small craft wishing to enter should approach the mainland shore at least 2 miles westward of the entrance, and keep close alongshore between the beach and the foul ground.

Rambler knoll, a small 10-fathoms patch surrounded by depths of from 12 to 17 fathoms, lies about 4½ miles southward of the southern sandspit forming Khor Omeira.

Jebel Kharaz, or the Highland of St. Antonio, attains a height of 2,720 feet above the sea near the northern end of the range, while its southern bluff rises 2,110 feet almost immediately from the northern shore of Khor Omeira. On the western side of the summit of the highest peak, is a ruin of roughly hewn stone, without date or inscription, but sufficiently remarkable to give a name to the mountain amongst the superstitious natives, by whom it is called Jebel Jinn, or the hill of the Genii, on account of some mystery attached to the building. The mountain is of limestone and granite formation.

Coast.—The coast between Ras al Ara and Ras Kaáu is low and sandy, with a few bushy shrubs, except that here and there a rocky point occurs, and, in places, steep banks or cliffs of hard sand from 20 to 30 feet high.

RAS KAÁU (*Lat. 12° 40′ N., Long. 44° 25′ E.*), about 145 feet high, showing as a black well-defined bluff, is a projecting point, 17½ miles eastward of the entrance to Khor Omeira. At 1½ and 2½ miles inland westward of Ras Kaáu, are two conspicuous sandhills with dark summits ; one, Jebel Sunamma, the westernmost and farthest inland, being 550 feet high ; the other, Jebel am Birka, 795 feet ; the latter is a double peaked saddle hill, with other smaller summits between it and the shore.

In the bay westward of Ras Kaáu, the water is everywhere very shoal, and, from the extreme of the point, a ridge of rocks, covered, but on which the sea almost always breaks, extends nearly 3 miles in a south-westerly direction.

Sandbank.—Between Khor Omeira and Ras Kaáu, a sandbank extends from 3 to 4 miles off shore, with irregular depths and possibly less water in places than is shown on the charts. A tongue with 5 fathoms at its extreme extends nearly 3 miles off shore about midway, and farther eastward is the bank below mentioned. Passing vessels should keep 5 miles off shore in not less depth than 20 fathoms.

General charts 6b, 8e, and 2523.

Chart 3180, Straits of Bab-el-Mandeb, &c. Var. 1° 40′ W.

Parseval rock was discovered in the year 1887, by the French ship of war of that name touching on it. It is situated on the bank just mentioned, and consists of a coral rock, 8 cables long, north-west and south-east, by 3½ cables wide, with a rocky head of 1½ fathoms near its southern edge, and close to the edge of the 10-fathoms contour line; about 2 cables east-south-east from the shoal, the depth is 4½ fathoms. From the rock head, Ras Kaáu bears N. 52° E. 4½ miles.

Chart 6b, Gulf of Aden, sheet 2.

BANDER IMRAN.—Eastward of Ras Kaáu, the shore is flat and sandy for a distance of 18 miles, as far as Ras Imran, but receding between the two points and forming Bander Imran, a bay nearly 5 miles deep; the land for some 10 miles inland is a sandy plain, covered with bushes; beyond the plain is Jebel Jabalam, 1,899 feet in height, and still farther are Jebel Zafala, 2,673 feet, and Jebel Kabuti, 6,566 feet in height, the latter 32 miles from the coast.

The depths in the bay are regular, there being 12 and 13 fathoms at 2 or 3 miles offshore, with no known dangers; the bottom is principally clay and sand, with an occasional patch of rock. There is excellent shelter during easterly winds at its eastern end under Ras Imran.

Ras Imran (*Lat. 12° 44′ N., Long. 44° 43′ E.*) is the south-western extreme of a small rocky island, divided from the mainland by a narrow channel almost filled with rocks; off its western side are three rocks of considerable height, with deep water close outside them. The point of the mainland is a rocky promontory, 712 feet in height.

Bander Fukom is the bay, about 5 miles wide, between Ras Imran and Ras Fukom, the western point of Jebel Ihsan; it has regular depths decreasing from 6 or 7 fathoms in the entrance, towards the shore, over a bottom of sand and mud.

Near its centre is Jezírat el Juhub, a round islet with a rock, barely covered, about 3 cables east-south-east from it, having from 5 to 6 fathoms water between it and the island; a shoal patch extends a short distance north-westward of the island.

On the western side of the bay is the tomb of Sheikh Sammara, surrounded by a few fishermen's huts. Off the tomb is Jezírat Abu Shamma, a small dark-coloured islet, and westward of it are two anchorages for boats. The land surrounding the bay is a low swampy tract.

General charts 8e, and 2523.

Chart 7, Aden harbour and approaches. Var. 1° 40′ W.

JEBEL IHSAN (Little Aden), a mountainous mass of granite, forming a peninsula, 6 miles long by 3 miles wide, is a portion of the British territory of Aden, and from its resemblance to Aden peninsula is known also as Little Aden; its highest peak, in the form of a sugar-loaf, rises to a height of 1,218 feet.

This promontory has numerous projecting points, to each of which the Arabs have given a name. On the south-western side are Ras Fukom and Ras Alarga; the most southern, Ras Mujallab Heidi, is the western limit of Bander Sheikh, a small bay. Ras Abu Kiyama divides this bay from Khor Ghadir, and the white tomb of Sheikh Ghadir is about 5½ cables northward of the extreme point. On the southern and eastern sides of the promontory are nine rocky islets, some of which are nearly connected with the mainland at low water springs.

Temporary anchorage.—Bander Sheikh, about half a mile wide, with 5 fathoms in the entrance, decreasing gradually towards the shore, affords anchorage for small craft during off-shore winds.

Khor Ghadir is similar to Bander Sheikh, though larger; the islet on its eastern side is connected with the shore by a sunken ledge.

Ass's Ears (*Lat. 12° 15′ N., Long. 44° 54′ E.*).—At the eastern end of Jebel Ihsan is a remarkable double peak of granite, 697 feet in height, which, from its peculiar shape, is known by the name of the Ass's Ears. The outline of the whole of Jebel Ihsan is very picturesque (*see* view on chart); a deep ravine winds through the hilly track from Bander Fukom to Bander Sheikh. The land to the northward is low, and on the eastern side, immediately at the back of the mountains, is Khor Bir Ahmad.

Ras Salil, 210 feet high, is the eastern extreme of Jebel Ihsan, and the termination seaward of the Ass's Ears mount. The water is deep fairly close to it.

Jezirat Salil, 52 feet high, is an islet 3 cables off the point westward of Ras Salil. A rock, one foot high, lies one cable eastward of it on a bank which surrounds the islet nearly to that distance east and north of it.

Square island, 135 feet high, lies half a mile northward Ras Salil and is connected with the shore abreast by a flat, nearly dry at low water.

Pinnacle rock, 70 feet high, is situated on the north extreme of a shallow bank a quarter of a mile in length;

Chart 7, Aden harbour and approaches. Var. 1° 30′ W.

Peaked rock, 25 feet high, lies at the south entrance of this bank. Between it and the point abreast are some low rocks, on the flat fronting the coast.

Khor bir Ahmad, or Seilan, extends 3 miles westward of its narrow entrance, which is situated north-westward of Pinnacle rock. There is a depth of 6 to 8 fathoms in the approach, and in the khor which opens out to a mile or more in width; its upper part has not been examined, but its shore consists of sand, covered with small scrub.

The khor derives its name from Bir Ahmad, a small fort and village, containing about 250 inhabitants, about 3 miles inland from the beach at the head of Bander Tauwahi or Aden West bay, and 6½ miles north of the Ass's ears; it is the residence of the chief of the Akrabi tribe. About 2 miles north-eastward of Bir Ahmad is the village of Seilán.

Charts 7, Aden harbour and approaches; 3660, Aden harbour.

ADEN PENINSULA.—General remarks.—This peninsula, within which lies the port of Aden, is high, rocky, and about 5 miles in length, east and west, by about 3 miles in breadth; the loftiest part bears the name of Jebel Shamshan, from the turreted peaks on its summit, of which the highest is 1,725 feet above the sea, and is visible at a distance of 40 miles in clear weather; it is almost entirely composed of limestone.

The peninsula promontory of Aden bears much resemblance to the rock of Gibraltar; it is almost divided from the mainland by Khor Maksa, a creek on the north-eastern side of the harbour similar to that behind Jebel Ihsan, or Little Aden, which gives these lofty promontories, not very unlike in appearance, the aspect of two sentinel islands guarding the approach to the bay and harbour they enclose.

Southern coast of the peninsula.—Numerous rocky points project from this mass of mountains, forming small bays and affording temporary shelter for small craft during offshore winds. On the southern side, eastward of Ras Tarshein, the west extreme of the peninsula are small bays on either side of Elephants Back, a point 173 feet in height, on which is a lighthouse; the eastern one is Conquest bay.

Ras Sinaila is the south extreme of the peninsula with deep water close in; between it and Conquest bay is Round island, or Jezirat Denafa, 110 feet in height, and connected to the shore by a sunken reef.

Eastward of Ras Sinaila is Ras Marshag, on which is a lighthouse, and close westward of it is Bandar Daras. Northward of Ras Marshag is Sirah island, 270 feet in height, in Aden

General charts 6b, 8e, and 2523.

Charts 7, Aden harbour and approaches; 3660, Aden harbour. Var. 1° 30′ W.

East bay, connected with the town of Aden by a causeway. The northern coast forms the southern side of the port of Aden.

The territory of Aden, which includes Aden peninsula and Perim, came into the possession of Great Britain in 1839, and is under the administration of the Government of Bombay. It comprises an area of about 80 square miles.

In the hinterland of Aden the British Government has treaty engagements with and subsidises the neighbouring Arab tribes, both inland and along the coast, from the straits of Bab-el-Mandeb to Muscat territory at Ras Sair. By an agreement with Turkey (1903–4) a line fixing the boundary of the tribes with which the British Government has treaty relations has been demarcated by a joint British and Turkish Commission, from Sheik Sayad, on the coast abreast Perim, to the Bana river.

The official establishment of the Political Resident is at the Residency, on the northern side of Ras Tarshein, the west extreme of the peninsula. The old town of Aden is at the eastern extreme of the peninsula (page 412); the business town, offices, warehouses, &c., form the southern side of the harbour.

The observation spot is Ras Marbut flagstaff (*Lat. 12° 47′ 12″ N., Long. 44° 58′ 27″ E.*).

THE PORT OF ADEN is a great coaling station and port of call for vessels passing to and from the Suez canal.

Bander Tauwahi, which is the port of Aden, lies between the Suez canal and the peninsulas of Jebel Ihsan and Jebel Shaumshan, and comprises the outer anchorage and the harbour of Aden. It is about 8 miles wide from east to west, recedes northward 4 miles, and is divided into two bays by a flat which extends about three quarters of a mile from the northern shore, south-south-westward of Aliyah island.

Harbour limits.—For administrative purposes the bay is divided into an Outer harbour, or anchorage, and Inner harbour. The Outer anchorage, or harbour, includes all that space between Jezírat Salil and Round island, the southern limit, and a line drawn north-west from the flagstaff on Ras Marbut mole battery, as charted, to the opposite coast.

The Inner harbour includes all that space eastward of the last-mentioned line.

The depths of water in the Outer harbour are from 4 to 6 fathoms, decreasing gradually from the greater depth towards the shore; the bottom in all parts is sand and mud.

General charts 6b, 8e, and 2523.

Charts 7, Aden harbour and approaches; 3660, Aden harbour. Var. 1° 30′ W.

The Inner harbour is available at high water for most of the vessels that come through the Suez canal, or to about 27 feet draught; within the bar are mooring berths for about eight vessels. *See* page 409.

Tides.—The tides at Aden anchorage are very irregular, being influenced by the current outside. It is high water, full and change, at 7h. 54m.; springs rise 7 feet, neaps 4½ feet, approximate. The tides are subject to a large diurnal inequality, which may increase or diminish the rise by one foot or more. About the time of the moon's quarters there is frequently only one high and one low water in the 24 hours.

Outer harbour.—**Anchorage** is prohibited in the Outer harbour, or anchorage, anywhere southward of a line drawn direct from Ras Tarshein to Jezírat Salil, but vessels of any draught may anchor northward of that line. A depth of 5½ fathoms will be found with the flagstaff at Ras Marbut mole battery bearing N. 44° E. and Round island S. 66° E.

Vessels of less draught may anchor farther in, in 4½ fathoms, with the same flagstaff in line with the clock tower N. 78° E. and the south extreme of Ras Tarshein S. 57° E. A ground swell at times rolls into this bay during the South-west monsoon. Pilots are not necessary for the Outer harbour.

Quarantine.—Quarantine is enforced against Indian ports when Egypt quarantines them, and against other ports as necessity arises. The limits of the quarantine anchorage in the Outer harbour are, northward of a line drawn from Aliyah island to the *Anadyr* wreck, and westward of a line drawn south from the wreck until it meets a line drawn direct from Ras Tarshein to Jezírat Salil. This anchorage is shown by a pecked line on both charts; that for small vessels in the Inner harbour, on chart 3660. *See also* Hospitals, page 411.

LIGHTS.—The main lights for approaching Aden are those on Ras Marshag on the eastern extreme of Aden peninsula and the new light on Elephant's back.

Ras Marshag (*Lat. 12° 15′ N., Long. 45° 3′ E.*).—An *occulting white* light, of the first order, *with a period of five seconds*, is exhibited, at 244 feet above high water, from a dark grey lighthouse, 85 feet high, on Ras Marshag, east extreme of Aden peninsula. The light shows thus:—light *three seconds*; eclipse, *two seconds*, and is visible 20 miles distant; it is chiefly of use to vessels making Aden from the eastward. Westward of Aden, it is not seen until it opens out southward of the higher land of Ras Taih. There is a signal station on the ridge north-westward of the lighthouse.

General charts 6b, 8e, and 2523.

Charts 7, Aden harbour and approaches; 3660, Aden harbour. Var. 1° 30′ W.

Elephant's Back light.—On the summit of the headland, 173 feet high, locally known as the Elephant's back, forming the western side of Conquest bay, is a wooden structure, 7 feet high, painted with black and white lines diagonally. From it is exhibited, at 180 feet above high water, a *white revolving* light with a half-minute period, visible 15 miles between the bearings N. 62½° E. and N. 36½° W., through north.

Beside the wooden light structure stand two poles, 2 feet apart and 30 feet high, painted black and white in alternate bands.

Light-boat.—At 7½ cables west from the Residency flagstaff on Ras Tarshein, in 3¾ fathoms, is moored a light-boat, painted red, from which is exhibited two *fixed red* lights vertically, and 8 feet apart. By day a *red* ball is hoisted at the masthead.

Wreck-marking light-vessel.—The wreck of the steam-vessel *Anadyr*, sunk in the Outer harbour N. 60° W., 11 cables from Ras Tarshein, is marked by a green light-vessel with one mast, moored one cable S. 22° E. from the wreck in 28 feet water. By day the light-vessel exhibits two balls horizontally, by night two *white* lights vertically on the side farthest from the wreck, and one *white* light on the near side, visible 5 miles.

A green buoy marks the south-western end of the wreck, which no longer shows above water.

Vessels entering or leaving the port should pass southward of the Anadyr light-vessel.

Shoal.—Buoy.—In the quarantine ground, a shoal patch, with about 16 feet over it, lies 3½ cables west-north-west from the wreck buoy, and N. 87° W. 14½ cables from Ras Marbut flagstaff. A red conical buoy is moored on the shoal.

Light-buoys.—Eight light-buoys mark the channel into the Inner harbour, three of which, conical, red, and showing *fixed red* lights, are on the southern side in entering; and four can buoys, the outer one painted black and white, the other three, black, all showing *fixed green* lights, are on the northern side of the channel, the three inner ones being on the edge of the bank.

The two outer light-buoys on the starboard hand are in the positions previously occupied by light-vessels, and both show *two red* lights *vertically*. The outer red light-buoy lies about 7⅓ cables, N. 40° E., from the light-boat off Ras Tarshein, and 4 cables, S. 85° W., from Ras Marbut, in about 26 feet; the

Charts 7, Aden harbour and approaches; 3660, Aden harbour. Var. 1° 30′ W.

next lies in about 18 feet, N. 50° W., 2 cables from Ras Marbut. The outer black and white buoy, showing a *green* light, is in about 25 feet, and lies only 1⅔ cables northward of the outer red light-buoy and 2 cables westward of the next.

DIRECTIONS.—Outer anchorage.—Aden peninsula and Little Aden peninsula are so prominent that there is no difficulty in recognising the approach to the port of Aden, which lies between them. There is a view on chart 7, of Aden from the southward.

In coming from either eastward or westward, there is no danger beyond half a mile or so from either shore, so that a berth of a mile will ensure safety. When in the fairway of the approach, course should be shaped to pass half a mile westward of Ras Tarshein, when the light-boat in the anchorage will at one time be seen about ahead, near which anchorage may be taken (page 405) if not about to enter the Inner harbour. The wreck of the s.s. *Anadir* lies westward of this anchorage, as charted.

Pilots are always in attendance on vessels approaching, and vessels are not permitted to enter the harbour without one. *See* Pilots, next page.

At night.—Coming from the westward vessels may steer for Elephant's Back light, as soon as it is visible (northward of a N. 62° E. bearing), and when about a mile from it shape course for the light-boat westward of Ras Tarshein, to the anchorage, where a pilot will be in attendance, on the usual signal being made.

Coming from the eastward, Ras Marshag light will be visible about 20 miles, in clear weather. Course should be shaped to pass about a mile or more southward of it, and when Elephant's Back light becomes visible (northward of a N. 36° W. bearing) course may be shaped for the light-boat situated half a mile westward of Ras Tarshein, thence proceeding as above directed.

Inner harbour.—Pilotage is compulsory for merchant vessels. *See* pilots, next page.

From the light boat off Ras Tarshein, the fairway course is between the red buoys on the starboard hand (*red* lights), and the black and white buoy and the black buoy within it, on the port hand (*green* lights), on entering in about 26 feet at low water springs; the rise of tide is irregular, but it varies from 4½ to 9 feet at springs. There is better water in certain

Charts 7, Aden harbour and approaches; 3660, Aden harbour. Var. 1° 30′ W.

dredged places in the harbour. For draught of vessels that have entered the harbour, *see* page 409.

Sand squalls, from the northward and eastward, sometimes occur, and give but little warning.

Harbour signals.—Copies of the port office, and general signals in use at Aden can be procured from the port offices at a small charge. The time the outward bound Peninsular and Oriental mail steamer passes Perim is signalled by this code from the Peninsular and Oriental flagstaff.

Pilots.—Merchant vessels entering the Inner harbour are obliged to take pilots. A man-of-war, on entering, will, if possible, be shown her berth by an official from the Port Officer's department.

No tidal signals are now made, the pilots being fully acquainted with the depths at all times on the bar; but navigators of vessels of heavy draught should satisfy themselves on this point by a reference to the state of the tide when entering or leaving.

Pilotage regulations.—No merchant vessel exceeding 100 tons burden is permitted to enter or leave the Inner harbour without the permission of the Conservator of the port. All merchant vessels arriving off the port, and wishing to enter the Inner harbour, must fly the pilot jack at the fore, and remain in the Outer harbour until boarded by the pilot. A pilot approaching a steam-vessel entering at night will flash a bull's-eye lamp at frequent intervals.

No fee is charged for the pilotage, by day, of a vessel out of the Inner harbour. In no other case is the fee for the pilotage of any vessel within the limits of the Port of Aden less than 10 rupees. Fees in excess of 10 rupees are calculated per 100 tons, or part thereof, of the vessel piloted, as follows, viz.:—Into Inner harbour by day, 2 rupees; by night, 3 rupees; out of Inner harbour by night, one rupee. Taking a vessel to or from her anchorage in the Outer harbour by day, one rupee; to her anchorage in the Outer harbour by night, 1½ rupees; out of the Outer harbour by night, one rupee. Taking a steamer or square-rigged vessel alongside another vessel in the port, or moving a vessel from one place to another, one rupee per 100 tons, in addition to any other pilotage fees.

When a pilot is detained on board a vessel for more than one hour after his arrival, by reason of the vessel not being ready to proceed, a charge of 10 rupees is made.

General charts 6b, 8e, and 2523.

Charts 7, Aden harbour and approaches; 3660, Aden harbour. Var. 1° 30′ W.

INNER HARBOUR.—Mooring buoys.—Depths.—Aden Inner harbour lies eastward of the second red light-buoy off Ras Marbut, and includes the inner bay. A dredged channel leads from the Outer to the Inner harbour, and both channel and Inner harbour have been persistently dredged for many years, dredging operations being still in progress (1908).

The depth over which a vessel must pass in entering is now 26 feet at low water, springs, and thence merges into the harbour proper, which is a dredged space close to and almost parallel to the Aden shore from Ras Marbut to about 2 cables eastward of Flint island, with depths varying between 25 and 31 feet; its greatest width is 2½ cables, abreast of the port office, and its least 1¾ cables, abreast of Flint island; its northern edge shoals suddenly to 15 or 16 feet, and has a hard bottom.

There are ten mooring buoys within this space, at four of which the least water is 28 feet, and at six of them it is 27 feet. The pilots secure any vessels up to 27 feet draught to any of these buoys and they lie afloat at low water.

Vessels are moored, head and stern, with the anchor ahead and the stern secured to one of the mooring buoys.

Vessels of more than 26 feet draught constantly enter the Inner harbour. Up to March 31st 1908, the two of the deepest draught where the steam ships *Poona* and *Pera*, both drawing 27 feet 8 inches. In July, 1906, during the south-west monsoon, the Japanese battleship *Katori* (draught not given) moored to No. 3 buoy, and took in 1,024 tons of coal promptly and safely.

Flint island lies on the south side of the deep water and has a channel, about half a cable wide, between it and the coal wharves, with a fairway depth of 11 to 12 feet.

Head of the harbour.—Eastward of Ras Hujaf is the head of the harbour, which is available for small craft, with depths of 2¼ fathoms for about a mile eastward of Jerema rock beacon. This inner bay is used solely by native craft.

There are several island in the Inner bay:—the eastern and principal one, Slave island, or Jezírat Sawayih, is 230 feet high and extends on the flat fronting the head of the harbour, nearly dry at low water; the others are Marzúk Kebir, Kais-el-Hamman, Kalfetein, and Feringi; and, on the sandspit forming the northern side of entrance to this bay are the two small islets Jam Ali, and Aliyah, the latter already described as a quarantine establishment.

Settlement.—Public buildings.—On the southern shore of the harbour, between Ras Marbut (Steamer point) and

Charts 7, Aden harbour and approaches; 3660, Aden harbour. Var. 1° 30′ W.

Ras Hujaf, is the business quarter of the port. In the bight southward of Flint island there is practically a new town, fronted by many coal wharves, whilst westward of it are the courthouse, local telegraph and post offices, offices of the Peninsular and Oriental and Messageries Companies, &c. and the military establishments near Ras Marbut, or Steamer point. The clock tower, of red brown stone, on the hill (137 feet) near Ras bin Jarbein, is very conspicuous. There is also a conspicuous white mosque near the Prince of Wales pier.

For Aden town, *see* page 412.

Piers and wharves.—The first pier eastward of Ras Marbut is the Pilots pier, and in the bight eastward of it is the Military pier, which extends to about the one-fathom contour line. A little eastward is the Port Office pier, and below the conspicuous clock tower is the Prince of Wales pier, near which is the court house. In the bight, in which is the business quarter of the town, are several coal wharves, as well as in the bight farther eastward and on Ras Hejáf. At the head of the harbour, westward of the barracks, is Obstruction pier, alongside which steam launches can lie at all times; there is a curve at its head.

Communication.—Telegraph.—The port of Aden has no railways; in all other respects its facilities for communication are unrivalled. By submarine cable it is connected directly with Bombay, Zanzibar, Perim, and Suez, and indirectly, therefore, with all parts of the world; the home rate is 2*s*. per word. By steamship, mail or otherwise, it has almost daily communication with all ports of importance, and by dhows, chiefly, with the ports of the Somali coast.

The submarine telegraph station is on a prominent point in the centre of the bay southward of Ras Tarshein. The local telegraph office is at the Prince of Wales pier, in the Inner harbour.

Trade.—Aden has a port trust and a chamber of commerce. It was declared a free port in 1850, and the only duties charged are on spirits, wine, opium, arms, and salt; since that date, for a long time, it engrossed nearly the whole of the coffee trade formerly enjoyed by Mokha, but in recent years a large portion of the coffee which had been passing through Hodeida to Aden is now shipped direct at the former place. Aden being a port for transhipment, the imports and exports are for the most part the same, the local consumption, except as regards coal, which may be considered import only, being small.

General charts 6b, 8e, and 2523.

Charts 7, Aden harbour and approaches; 3660, Aden harbour.

The principal articles of trade are hides, skins, ivory, feathers, gums, mother of pearl shell, and pearls, &c., brought chiefly from the African coast; coal, silk and cotton goods, dates, flour, cattle, sheep, tobacco, kerosine oil, malt liquors, wines and spirits. There are salt pans near Aden, and, consequently, large shipments of salt take place annually, chiefly to India. The aggregate value of the trade at Aden in 1907 was over 6,600,000*l*. In the same year, 1,469 merchant vessels, chiefly steam-vessels, and nearly 2,000 country craft, with an aggregate tonnage of nearly 3,000,000, entered and cleared.

Hospitals.—The new European general hospital is in charge of a senior officer of the Indian Medical Service, assisted by an assistant surgeon and native hospital assistants, also by European nurses, as presently explained. It stands on a spur above the port office pier, which latter is a very convenient landing place for it. It contains 25 beds, and affords ample accommodation for officers and men, having both private and public wards for medical and surgical cases, special pavilions for women, mental cases, measles, scarlatina, and diphtheria. It has also an X-ray room and an operating theatre fitted with every modern improvement. Three trained nurses are attached to the institution. For the mercantile marine, the fees, including nursing, are, for officers 5 rupees, for men 3 rupees, each, daily.

The quarantine hospital on Aliya island is set apart for plague and cholera cases, and a special hospital is provided on the Maal plain for small-pox and chicken-pox.

A steam disinfecting stove, available for shipping, is installed on Flint island.

Population.—In 1901 the population of Aden territory, including Perim, was 43,974.

Climate.—Winds.—The climate of Aden is not insalubrious, and though very hot during the south-west monsoon, is not so intensely hot as that of the Red sea. Heat apoplexy is common during the hot season amongst the mercantile marine, especially amongst the firemen. During the cool season, chills are especially to be avoided. *See also* pages 9 and 10, and Meteorological table, page 559. Cyclones occur in the vicinity of Aden, for which *see* page 18.

Supplies, repairs, &c.—Provisions of every description are procurable from the stores in Aden harbour; fruit and vegetables are scarce; ice can be obtained. Distilled water

Charts 7, Aden harbour and approaches; 3660, Aden harbour. Var. 1° 30′ W.

may be purchased at about 3*s.* per 100 gallons. There is no factory capable of doing very heavy work, but repairs, both to hull and machinery, may be effected by the firm of Luke Thomas & Co.; castings up to two tons can be made. There are no piers or wharves for vessels.

Docking accommodation.—There is a floating dock that will take a vessel of 750 tons, if not over 185 feet long; and a patent slip, 75 feet in length, for small craft and launches only. Cranes capable of lifting from one to 10 tons are available; also steel blocks, wire falls, and booms for use as derricks, ashore or afloat, capable of lifting 50 tons; powerful salvage pumps and portable boilers are kept in readiness.

Coal.—About 200,000 tons of coal are imported annually and about 50,000 tons are usually in stock at Aden, which mostly belongs to large steamship companies. There are great facilities for coaling in the Inner harbour, and no interruptions; and, through recent dredging operations, nearly all vessels that are at present allowed through the Suez canal, or up to 27 feet draught, can enter and moor in the Inner harbour, in charge of a pilot.

Coaling in the Outer road is liable to interruption from the weather, especially during the south-west monsoon, from early June to mid-September. Coaling is effected by means of lighters, always kept loaded and in readiness.

RAS MARSHAG.—Anchorages.—Ras Marshag, the eastern extreme of Aden peninsula, 1¾ miles eastward of Ras Sinaila, is a narrow projecting cape, and affording shelter during westerly winds to the anchorage of Bander Daras, the little bay between it and Ras Taih. *See* Light, page 405.

Between Ras Marshag and the island of Sirah the curve of the land forms Bander Hokat, a small sandy bay; and, northward of that island, between its northern point and Ras Kutam, is another small bay, close to the town of Aden; they are only of importance to sailing craft.

Aden town. The town of Aden is on the eastern side of the peninsula, and about 4 miles by road from the western part of Aden harbour. It is built on a plain, rather more than half a mile square, encircled on the land side by singularly pointed hills, with its eastern face open to the sea, while immediately in front is the rocky fortified island of Sirah. The tanks, a portion of a valley dammed up for supplying the town with water, are objects of interest.

The barracks and military hospital are situated 1½ miles northward of Aden town, at the head of the harbour.

General charts 6b, 8e, and 2523.

Chart 7, Aden harbour and approaches. Var. 1° 30′ W.

The Residency, as before stated, is situated near Ras Tarshein, at the west end of the peninsula.

Anchorage.—The depths, north-eastward of Sirah island end of the town, are regular, so that a vessel may choose her own berth, in from 5 to 10 fathoms. During the north-east monsoon a heavy swell rolls in; but, from June to August, with the wind from the westward, good anchorage and smooth water may always be found under the island. During these months, if wishing merely to communicate with the authorities, this anchorage may be found convenient, being near the town. The hot dry gusts blowing from over the hills are usually strong and disagreeable.

The description of the Arabian coast, eastward from Aden, is continued in Chapter XI., at page 487.

General charts 6b, 8c, 2523, & 1012.

CHAPTER IX.

AFRICAN COAST.

FROM THE STRAITS OF BAB-EL-MANDEB TO RAS AL HAMAR, SOMALI COAST.

(*Lat. 12° 25′ N., Long. 42° 33′ E.*)
(*Lat. 11° 20′ N., Long. 49° 19′ E.*)

VARIATION IN 1909.—Decreasing 4′ annually.

General remarks.—In this chapter the description of the African coast, being the western and southern shores of the Gulf of Aden, is continued from chap. V., page 276.

The straits of Bab-el-Mandeb, &c., are described in the concluding pages of that chapter.

Chart 3180, Straits of Bab-el-Mandeb.

COAST.—From Ras Siyan, the coast trends southward with an outward curve for 31 miles to Ras al Bir. In the first portion it is low, sandy, covered with jungle, and fronted by a rocky reef extending from 5 to 8 cables offshore. The depths are regular, increasing gradually from the edge of the shore reef, the 20-fathoms line being distant about 3 miles from the shore, and the 100-fathoms line about 8 miles. There are 2 creeks at 4 and 6 miles southward of Ras Siyan. Khor Angar, the southernmost, has a small islet close inshore just northward of it.

Chart 253, Jebel Jan to Shab Kulangárit.

JEBEL JAN.—Aspect (*Lat. 12° 16′ N., Long. 43° 22′ E.*).—Jebel Jan is the highest of three or four ranges of table mountains, which reach a great height, and approach close to the coast. It is about 13 miles southward of Ras Siyan and 18 miles northward of Ras al Bir.

There is anchorage off Jebel Jan, and, though quite exposed, and no better than others along the coast, it has the advantage of the foreshore being free from reef.

Southward of the high land of Jebel Jan, the coast again becomes low and sandy, until within about 5 miles of Ras al Bir, when it commences to rise towards that point. Between the shore and the mountains is an extensive plain covered with mangrove bushes and brushwood. Fronting this low sandy

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° 10′ W.

shore shallows extend at about midway, about a mile off-shore, as charted. The light on Ras al Bir is obscured over the northern part of this shallow water, but seen within 11 miles of the light, it should be kept westward of a S.W. ½ S. bearing.

RAS AL BIR, the northern point of entrance to the Gulf of Tajura, is a cliffy point, from 70 to 100 feet high. From its pale colour it would be difficult to distinguish at night but for the light. It is, however, almost steep-to, the reef fringing it being only half a cable wide, and there is no bottom at 30 fathoms, at half a mile off the point.

LIGHT (*Lat. 11° 58′ N., Long. 43° 22′ E.*).—At 365 yards within the extreme of Ras al Bir stands a square grey lighthouse, 39 feet high, from which is exhibited, at 157 feet above high water, a *fixed white* light, visible in clear weather at a distance of 15 miles, between the bearings S. 28° W. and N. 77° E.; the glare has been seen at a distance of 23 miles.

GULF OF TAJURA.—From Ras al Bir, the Gulf of Tajura, including Ghubbet Kharab at its head, is 55 miles in length in a west-south-westerly direction. Its southern point of entrance is Ras Jibuti, which bears S.W. by S. 25 miles from Ras al Bir; the Mashah islands with their extensive coral reefs lie off Ras Jibuti towards the middle of the gulf on this line of bearing.

The fairway depth in the entrance ranges from 300 to 500 fathoms, and it is fairly deep farther in, but has not yet been sounded to any extent; anchorages here are scarce, and do not afford much security. The coast all round the gulf is, with rare exceptions, high, and at a short distance inland, mountainous.

The villages or settlements on the northern shore of the gulf are, Obokh, Tajura, Ambaba, and Sagallo; scattered parties of the Danakeli tribe may occasionally be seen when, pasture being scarce in the interior, they drive their flocks down to the coast. On the southern shore of the gulf the only settlement is Jibuti, where the French have their principal station and Resident.

Protectorate.—The whole gulf, including these islands, is under the protectorate of France. *See also* page 431.

Natives.—The natives are of the Donakil or Danakeli tribe, whose territory formerly extended inland to the borders of the kingdom of Shoa. They probably exceed 5,000 in number, and are subdivided into several smaller tribes. They are, generally speaking, a tall race, the men averaging 6 feet in height. They

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° 10′ W.

are rich in cattle, bullocks, sheep, goats, and camels; their religion is Mohammedan. Opinion formerly seems to have been divided as to the character of these people, but the probability is, that if treated kindly and their prejudices respected, they in return will act civilly. They are now under the French protectorate, as before stated. The produce of the southern side of the gulf is brought to Zeila, where it is exchanged for coarse white and blue cloth, tobacco, &c. The sea coast is barren, but its interior is fertile.

Plan of Obokh, sheet 919.

OBOKH (*Lat. 11° 57′ N., Long 43° 17′ E.*), is about 4 miles westward of Ras al Bir. The place when first occupied by the French, in 1884, had only about 30 inhabitants; this number had increased to 700 or 800 natives in 1887, and caravans were organised to open up trade with the interior; but Obokh has since been abandoned as a settlement and only maintained as a submarine cable station, the only European resident there now being the cable operator. The Government establishment, with this exception, and all stores, provisions, and movable appliances, were long since transferred to Jibuti.

The piers shown on the plan are in a ruinous condition, and the only landing place now is on the beach. In 1906, the three deserted lighthouses, the penitentiary, the Government residence, and the factory were all recognisable, but the pyramid beacons could scarcely be made out.

Obokh river runs into the harbour about half a mile northward of the Lachocheterie bank; it is an inconsiderable stream and dries up in the summer months.

The country is not unhealthy, and the temperature is supportable during the winter season. At all times it is advisable to use precautions against the sun.

Communication.—Obokh is in telegraphic communication with Perim and Jibuti by submarine cable, which leaves this shore from the point south-westward of Cape Obokh, and thus with the general system. A vessel occasionally visits the place, but there is no regular communication by this means.

Obokh harbour is formed by the bight in the coast just eastward of Cape Obokh, and is protected by outlying shallow reefs, extending from one to 1½ miles offshore. The shape and position of these reefs or banks causes a division into two parts of the space available for anchorage, which parts are called the South and North-east ports.

The south entrance is available for all classes of vessels, but from its south port to the channel is unbuoyed, but there is

Plan of Obokh, sheet 919. Var. 2° 10′ W.

plenty of water. The entrance to its North-east port was reported closed in 1892.

Laclocheterie bank extends about 6 cables eastward of cape Obokh, with some huge boulders thrown on it by a recent cyclone, and with other portions of it dry at very low springs. Between it and the Surcouf bank is the channel into South port.

Surcouf bank, the middle one, is 1¼ miles long and from 3 to 5 cables wide, with a coral reef, dry at springs, about 4¾ cables in extent, near its western end; the remainder has from one foot to 3 fathoms, coral.

Curieux banks stretch off half a mile from the north-eastern point of the bay, leaving the closed east passage, presently described, between them and the Surcouf bank.

Bisson bank is a continuation of the shore reef lying between South port and North-east port, and projecting out in the centre to the distance of 6 or 7 cables from the mainland. Its outer part dries in places at very low springs.

Pearl bank, with a least depth of 2½ fathoms, occupies the greater part of the fairway from South port to North-east port between the western portions of Surcouf and Bisson banks. Middle bank, with 1¾ fathoms least water, lies north-eastward of Pearl bank.

Beacons.—A white stone pile (D), erected on the hill, 62 feet high, at the head of the harbour; and a white stone pyramid beacon (C) on the coast eastward of Buret bay; these beacons are not easily seen, and will probably soon disappear.

Tides.—It is high water, full and change, at from 7h. to 9h. 30m.; springs rise about 8¼ feet. There is considerable diurnal inequality, chiefly affecting low water of neap tides.

South port affords anchorage in from 6 to 17 fathoms for four or five vessels; it is protected from all winds except those from the south-westward, from which quarter strong winds blow at times, rendering the port dangerous. It is also known that the mooring buoy of the Messageries steam vessels, with their chains extending from it, remains sunk about the middle of this port, as well as three cables and anchors lost from other vessels; therefore a vessel anchoring here runs considerable danger of losing her anchor. Vessels might shift berth to the North-east port on the approach of bad weather, there being a straight but narrow channel connecting the two ports with

General charts 253, 8e, and 6b.

Plan of Obokh, sheet 919. Var. 2° 10′ W.

from 8 to 10 fathoms water shown by a pecked line on the plan. *See* directions.

Buoys.—The entrance to South port lies between the eastern extreme of Laclocheterie bank, marked by a black buoy, and the western extreme of the Surcouf bank, marked by a white buoy; it is about 3 cables wide, with a mid-channel depth of from 20 to 30 fathoms. The buoys described, though given colours, are reported to be simply rust-coloured, and as they may break adrift at any time and would probably not be renewed, no reliance should be placed on their being in position. Fishermen sometimes show a light at night from the Laclocheterie buoy.

North-east port is more difficult of access; it has, however, a larger space available for anchorage than South port and more convenient depths of water, from 5 to 8 fathoms. Its former direct entrance, East passage, between the north-eastern end of the Surcouf reef and the Curieux banks extending from the shore, was reported as closed in 1892, and to reach that port, therefore, a vessel must proceed to it through South port.

Directions.—South port.—No pilots can be obtained for Obokh. A vessel coming from the north-eastward, and having passed Ras al Bir, must shape course to pass southward of the Surcouf bank. The telegraph house on cape Obokh may serve to identify the place. When cape Obokh bears W.N.W., steer for it until the channel is open, when run in between the two entrance buoys on about a North course, anchoring northward of Laclocheterie buoy in from 10 to 14 fathoms, bearing in mind the warning already given as to lost anchors and cables at this anchorage. The holding-ground, stiff mud, is very good.

From South port to North-east port.—The pecked line should be followed, the vessel being navigated from aloft with the sun in a favourable position, or buoying the passage beforehand.

Winds and weather.—During the North-east monsoon, from October to April, the wind at Obokh blows from E.S.E. to E.N.E., with varying force. The breeze freshens in hauling to E.N.E. and slackens when blowing more from the southward. It is generally calm during the months of May and September. The South-west monsoon makes itself felt from June to August, sometimes with violence, but always in an intermittent manner. The Khamsin is a northerly wind, dry, scorching, and loaded with sand; it springs up suddenly, especially in these months, and sometimes blows very hard. The south-westerly wind

Plan of Obokh, sheet 915. Var. 2° 10′ W.

prevails generally in the morning, and the Khamsin rises suddenly in the afternoon and lasts to the middle of the night. Sometimes it continues through the night, decreasing in force, but resuming greater strength towards 7 or 8 a.m., blowing in this manner for three or four consecutive days; in June 1892 it lasted incessantly for seven days. During a Khamsin, the thermometer on shore frequently rises to 113° Fahrenheit. In July 1884, H.M.S. *Ranger* experienced this wind and found the thermometer, which had been 89° at noon, rise to 100°, with the wet bulb at 75°.

Chart 253, Jebel Jan to Shab Kulangárit.

COAST.—Ras Dúan (*Lat. 11° 48′ N., Long. 43° 4″ E.*) is an abrupt precipitous cliff, about 400 feet high; it lies 21 miles west-south-westward from Ras al Bir, and is the eastern extreme of Mersa Dúan; it is fringed by reef and shoal water for about half a mile, whence it deepens suddenly, there being from 20 to 50 fathoms a short distance from it. Between the shoals off Obokh and Ras Dúan there are no outlying dangers, except a patch of 1½ fathoms three-quarters of a mile off shore, and 4 miles eastward of the latter; but from Latola, 3 miles westward of Obokh, to Arkailé, 6 miles farther westward, shallow water extends from half a mile to one mile from the shore. Between Obokh and Ras Dúan the coast forms a bay, of which the shore for nearly the whole distance to Ras Dúan is a precipitous cliff, the mountains approaching close to the sea; these mountains are thickly covered with trees, and the valleys appear to be fertile.

Anchorage, with good shelter in off-shore winds, may be had in this bay in from 12 to 16 fathoms, excellent holding-ground, one mile from the shore and from 3 to 5 miles westward of Obokh. Native vessels make use of this anchorage.

There is also anchorage at Dallai, southward of the reef off Mido point; where there is landing on the beach and also at Yaia cove, 1½ miles north-eastward of Ras Dúan.

Mersa Dúan (*Lat. 11° 47′ N., Long. 42° 59′ E.*).—Between Ras Dúan and Ras Ali, 6½ miles to the westward, the coast forms a bay fronted in its western half by a reef extending nearly 3½ cables from the shore.

Mersa Dúan is a gap in this reef affording good anchorage and shelter for small craft during the South-west monsoon, it being protected by the reef projecting from Ras Ali, which is dry in some parts at low water. The depths at this place are from 3⅓ to 15 fathoms, increasing rapidly to 65 fathoms at one mile from the bank. It is not a good anchorage during the

General charts 8e and 6b.

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° 20′ W.

North-east monsoon or when easterly winds prevail. In the eastern part of the bay, immediately at the base of the table-topped cliffs forming Dúan bluff, and three-quarters of a mile inland, are three wells; two of them are cold springs of excellent water, the other is a hot spring of a temperature of about 100° Fahrenheit. A path leads from this bay to the village of Tajura, about 7 miles farther westward.

The coast between Ras Ali and Tajura, a distance of 3½ miles, is rocky, precipitous, and steep-to, except at one mile eastward of Tajura, where a small reef projects, which is steep-to. In this neighbourhood the land rises gradually towards the mountains in the interior.

Khor Ras Ali, a narrow inlet three-quarters of a mile in length, is situated close westward of Ras Ali; it has from 6 to 7 fathoms water, with a mud bottom, and affords shelter for small craft from all winds; there is however a rocky bar, with only 9 feet at high water, across its entrance. During the South-west monsoon this anchorage is made use of by native craft.

Plan of Tajura anchorage on 2090. Var. 2° 10′ W.

TAJURA (*Lat. 11° 17′ N., Long. 42° 53′ E.*).—Tajura is a village of about 200 huts, and containing about 1,000 inhabitants; the chief of the Danakeli tribe, who bears the title of Sultan, resides here. The village is built close to the sandy beach, with a mosque near either end; beyond the extremes of the village are two coral-built white houses. At the back of the village on the height is a rude fort, at which the French flag is hoisted. There is very little trade here now, that which formerly existed having been diverted to Jibuti.

Water.—Good water is obtainable from wells sunk about 10 feet deep.

The anchorage at Tajura is merely an indentation in the shore reef, which extends about 2½ cables off; immediately outside it the water deepens rapidly. The available area is of horse-shoe shape and at the anchorage, 1½ cables from the shore, is barely one cable wide between the reefs, with from 6 to 10 fathoms water. It is only during the North-east monsoon that native craft can lie at this anchorage; during the South-west monsoon it is untenable.

There is temporary anchorage in about 12 to 15 fathoms, with the remarkable house westward of the town bearing N. ½ E., and the isolated house eastward of the town E.N.E.

General charts 8c and 6b.

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° 20′ W.

COAST.—From Tajura to the entrance of Ghubbet Kharab, a distance of 18 miles in a south-westerly direction, the shore is bold, there being from 10 to 15 fathoms in most places close in, and, immediately outside, from 30 to 40 fathoms. In the neighbourhood of Tajura, and for 9 miles to the westward, the mountains recede about 3 miles from the coast, but from thence westward they approach close to the sea.

Jebel Gudeh, 5,459 feet high, is a table mountain, and the highest part of this range. The mountains are thickly covered with forest.

Ambaba (*Lat. 11° 41′ N., Long. 42° 50′ E.*), situated in a small bight where good fresh water may be procured, is a small village situated in a grove of trees in a bight of the coast 4 miles south-westward of Tajura. The inhabitants possess herds of cattle and flocks of sheep.

There is fairly good anchorage in from 12 to 14 fathoms, mud, in fine weather or with off-shore winds, with the village bearing N.N.W., and there are depths of 3 to 4 fathoms close to the beach; the water deepens quickly to seaward.

Pointe des Palmiers, 6 miles south-westward of Ambaba, is a slightly projecting point of land on which is a cluster of palm trees. About three-quarters of a mile inland is Mount du Sphinx, standing detached.

Sagallo village is 7 miles south-westward of Ambaba, and about the same distance from the entrance to Ghubbet Kharab; it is in ruins and abandoned, but the natives bring their flocks to the neighbourhood when pasturage becomes scarce in the interior.

GHUBBET KHARAB, at the head of the Gulf of Tajura, is a basin of irregular shape, about 11 miles long in a north-westerly and opposite direction and about 5 miles wide. The northern and southern shores consist of precipitous limestone cliffs, rising from 400 to 2,000 feet above the level of the sea. In the ravines were seen masses of rock, and trees of considerable size torn up by the roots, lying in the direction of the ravine, and evidently borne down by mountain torrents. The whole of the western shore is volcanic, and the valley is strewn with lava and volcanic remains; the lava extends 2 or 3 miles inland to the foot of a range of sandhills rising 200 or 300 feet above the plain.

From the summit of these hills, Bahr Assal or Salt Lake, said to supply Abyssinia with salt, is visible 5 or 6 miles to the north-westward.

General charts 8e and 6b.

Plan of Entrance, sheet 2090. Var. 2° 30′ W.

Entrance (*Lat. 11° 33′ N., Long. 42° 42′ E.*).—**Depths.**—The entrance to Ghubbet Kharab is $4\frac{1}{2}$ cables wide, and divided into two channels by Bab or Pass island, a rocky islet, about 36 feet high. The southern channel, or Great pass, with from one to $2\frac{3}{4}$ fathoms, is nearly $2\frac{1}{2}$ cables wide, over a rocky bottom, and is only practicable by boats or small vessels drawing less than 6 feet, and then only at slack water, as with any wind and tide a large wave is produced in the middle of the channel which boats cannot cross without risk of foundering.

The northern channel, or Little pass, is less than a cable wide, between steep banks, with depths of from 14 to more than 22 fathoms.

The tidal streams rush through this channel with great rapidity, causing whirls and ripplings, giving them a dangerous appearance; and, in the North channel, the only one practicable for vessels, at times attaining a rate of 7 knots. The passage through should, when feasible, be made at or about slack water, which, however, is usually of but short duration, lasting only a few minutes.

There is a flagstaff about 4 cables northward of the northern entrance point, and about a mile northward of it a hill with a remarkable tree on its summit. Just northward of the entrance are some ruins, and below high water mark is a hot spring; at high water it is not seen.

Chart 253, Jebel Jan to Shab Kulangárit.

The depth in the centre of Ghubbet Khareb is above 100 fathoms, and the cliffs on either side are steep-to, affording no anchorage. It is a remarkable fact that the mud brought up by the lead, even at a depth of 105 fathoms—after scraping off the outer coating—is perfectly fresh to the taste, notwithstanding that the water at the surface is so exceedingly salt as to be painful to the eyes when used for bathing purposes.

Islands.—On the western side is Bud Ali, a precipitous, inaccessible island 545 feet high, of a reddish white appearance; north-westward of it is Little Bud Ali, 262 feet high, entirely volcanic, the course of the lava being plainly perceptible down its sides. On the mainland, close to Bud Ali, is the mouth of an exhausted crater, about 300 feet in diameter and apparently 300 feet deep.

Besides these islands are two others, Parrot island or Had Ali, on the southern shore; the other, a mere dry rock on the northern or Danakeli side, having a narrow channel between it and the shore with 10 fathoms water, mud bottom.

Tides.—In Ghubbet Kharab the tide is about an hour later than in the Gulf of Tajura, varying, at high water, full and

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° 30′ W.

change, between 8h. and 10h. 30m.; the rise is about 6 feet. The day tide is the stronger.

Temperature.—The heat in Ghubbet Kharab during the hot season, May to October, is excessive, when temperatures of 104° to 113° Fahrenheit are not rare; from November to April it ranges from 73° to 84°.

Plan, Etoile anchorage, sheet 2090.

Etoile anchorage, an inlet on the northern shore of Ghubbet Karah, 1¾ miles within the entrance, is about 1¼ miles in length in a north-westerly direction, and from 2 to 3 cables wide, and has depths of from 11 to 17 fathoms, sand and mud; an island, with some sunken rocks north-west of it, lies on the north shore at the entrance.

This is the best anchorage in the Ghubbet, and is of sufficient capacity to afford good shelter to large vessels from all winds. In entering, keep towards the southern shore to avoid the rocks and shoal ground westward of the island; give Etoile point, the southern entrance point, a berth of 1½ cables when rounding it.

Plan, Salt Lake anchorage, sheet 2090.

Salt Lake anchorage, at the north-western extreme of the Ghubbet, is exposed to easterly winds; but otherwise there is good anchorage in 7 fathoms, sand and mud, at 2½ cables from the southern shore. The south-western portion of the bay is very shallow.

At the western side of the anchorage is a small basin about 150 yards in diameter, surrounded by precipitous volcanic cliffs, and having from 6 to 15 fathoms water. The entrance is completely closed at low water by a ridge of rocks; the water is always running from it, even during flood tide; the natives have an idea that it is connected subterraneously with Bahr Assal, but of this no signs are apparent, nor is the water at all agitated.

Plan, Bud Ali anchorage, sheet 2090.

Bud Ali anchorage.—A vessel may anchor westward of the centre of Bud Ali in 16 fathoms at about 1½ cables from the shore, from which the reef projects half a cable; here there is protection from easterly winds, but, from the great depth of water close at hand, the anchorage space is very limited.

There is also limited anchorage in the bight, 6 cables long and about 1½ cables wide, just northward of Little Bud Ali, in

Plan, Bud Ali anchorage, sheet 2090. Var. 2° 20′ W.

from 8 to 12 fathoms; this anchorage is open to easterly or south-easterly winds.

Plan, Boutres anchorage, &c., sheet 2090.

Boutres anchorage. — There is a moderately good anchorage immediately outside Ghubbet Kharab in from 15 to 17 fathoms, mud, 3 cables from the shore and protected from easterly winds by the rocky islet of Boutres, separated from the mainland, and extending half a mile from the shore.

COAST.—From Ghubbet Kharab eastward the southern coast of the Gulf of Tajura has a general easterly trend as far as Ras Jibuti. Besides the Boutres anchorage just described, the only other anchorages of the least importance on this shore are at Eiro, Khor Ambada, and Jibuti.

The whole of this southern coast-line as far as Manga Daffa, 5 miles westward of Ras Jibuti, is bold and precipitous, the mountains approaching closely to the sea, and the cliffs lining the shore being 100 or 200 feet high, and rising inland to a height of 400 or 500 feet. From Manga Daffa eastward, the shore becomes low and swampy.

Eiro anchorage, 9½ miles eastward of Ghubbet Kharab, is the small bay just westward of Ras Eiro, where shelter may be found from easterly winds in 12 fathoms, close to the cliffs; this shelter, though the holding-ground is indifferent, may prove of value, as in the whole length of coast from Boutres anchorage to Khor Ambada, a distance of 18 miles, there are, except at this one spot and perhaps some other trifling exceptions, depths of from 20 to 50 fathoms water close in to the cliffs.

Plan of Khor Ambada, chart 253. Var. 2° 10′ W.

KHOR AMBADA (*Lat. 11° 35′ N., Long. 43° 0′ E.*)—This small inlet, on the southern side of the Gulf of Tajura, is about 7 miles westward of Jibuti; it is a narrow and deep opening through the dark volcanic lava cliffs, forming the bed of the river Ambada, which is dry at the lowest tides, and into the head of which runs a stream of fresh water.

Anchorage.—There is good anchorage in from 12 to 15 fathoms off the Khor, formed by a reef extending 4 cables from the shore on the western side of the anchorage; by other shoals extending 6 cables from the shore on the eastern side, affording protection from easterly winds, and by a reef with from 6 feet to 3 fathoms nearly 4 cables in extent on the northern side of the anchorage, leaving an entrance to the anchorage on either side of it. Around these patches and towards the shore are depths of 12 to 17 fathoms, sandy bottom

Plan of Khor Ambada, chart 253. Var. 2° 10′ W.

The channel eastward of the central shoal is about 3 cables wide; the western entrance is about 2½ cables, both having deep water; half way between Black rock and Observation point is a white spot of triangular form on the shore, which is a useful guide in steering for the anchorage; when bearing S. 30° W., it gives a good leading line for the north-eastern channel, and when bearing S. 26° E., for the north-western channel.

The best anchorage is about 2 cables northward of the white spot in from 12 to 14 fathoms, sand and mud. Here there is good shelter in both monsoons, and boats are always able to pass between the ship and shore.

Water.—The springs supplying the stream at the head of the inlet are covered at high water; the spot is accessible to boats at half tide; and, in order to ensure the freshness of the water, the supply should be taken in on the flood. There are two small lakes a short distance inland from this spot; but the water is not drinkable.

Vessels desirous of obtaining water here must however be on their guard, for, in 1886, the captain and eight men of the French ship of war *Penguin* were murdered by the natives whilst on watering duty on the border of the northernmost of these lakes.

COAST.—From 2 or 3 miles westward of Khor Ambada eastward to Ras Jibuti, the shore is fronted by a gradually widening bank of soundings of from 10 to 30 fathoms, with several shallow patches of 2 fathoms and less, and in the bay between Manga Daffa and Jibuti a mud flat and rocky foul ground extends more than a mile off-shore.

Plan of Jibuti bay on chart 253.

RAS JIBUTI (*Lat. 11° 36′ N., Long. 43° 10′ E.*), 8½ miles eastward from the entrance to Khor Ambada, is the southern point of entrance to the Gulf of Tajura. It is the low rocky northern point of a small peninsula, portions of which are at times overflowed by the tide, projecting about 2 miles northward from the coast and forming the eastern side of Jibuti bay.

Plateau du Héron.—Close off it is the flat coral island, Plateau du Héron, about 35 or 40 feet high, standing on a coral reef and connected with the point by a strip of sand uncovering at half tide.

Reefs.—Buoyage.—The west extreme of the coral reef, on which is the Plateau du Héron, is the eastern side of the entrance to Jibuti bay, and is marked by three black buoys as follows:—No. 3, the outermost, and also No. 2, are truncated cones without topmarks.

General charts 253, 8e, and 6b.

Plan of Jibuti bay on chart 253. Var. 2° 10′ W.

Light buoy.—No. 1 is a black buoy showing a fixed *white* light. For the buoys on the eastern side of the approach to Jibuti bay, *see* p 427.

Chart 253, Jebel Jan to Shab Kulangárit.

JIBUTI BAY APPROACH.—Mashah islands lie in the fairway of the approach, but on the southern side of the main channel into the Gulf of Tajurah, and in the north-eastern approach to Jibuti. The group consists of three coral islands and five islets from 30 to 40 feet high, on a reef extending 7 miles in an east-north-easterly direction, with a width of 3½ miles.

The northern channel into the gulf is 7 miles wide, and perfectly free from danger, having no bottom anywhere except close inshore at 40 fathoms.

The southern channel is 2¼ miles wide at its narrowest part between the rocky bank south-westward of Maskali and the series of rocky patches extending northward from Jibuti bay; the soundings here are regular, from 15 to 20 fathoms, mud.

The islands are surrounded by coral reefs, dry in many parts at low water, with outlying isolated patches for a distance of from 1½ to 2½ miles. Eastward of them the depths are irregular, with overfalls, for a distance of about 4 miles. The eastern island is named Mashah; the westernmost Maskali.

LIGHT (*Lat. 11° 43′ N., Long. 43° 13′ E.*).—On Scorpion point, on the north-eastern extreme of Mashah island, stands a white quadrangular masonry tower, 47 feet high, from which is exhibited at 64 feet above high water a *fixed red* light, visible 8 miles. The light shows with its full power between the bearings of N. 60° W., through west and south to N. 30° E., and faintly in other directions, except on about a north-westerly bearing, where, within a small arc, it is obscured.

Quarantine.—The quarantine establishmeut for Jibuti is at the northern entrance of Maskali island. It consists of a three-roomed one-storey building surrounded by a verandah, with a kitchen erected a few yards from it.

Anchorage.—There is temporary anchorage in from 6 to 9 fathoms, sand, in a gap in the reef half a mile northward of the eastern island, with the lighthouse bearing about S.E. ¾ S. A good look-out is necessary on entering this anchorage, as several rocky patches lie detached from the main reef, and one of 2 fathoms, not shown on the chart, is said to lie nearly in mid-channel. It affords fairly good shelter at all seasons.

General charts 8e and 6b.

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° 10′ W.

During the North-east monsoon, good anchorage may be had westward of the reefs on the northern side of the islands in 17 fathoms, sand, at about a mile south-southward of the bell buoy, with the west point of Maskali bearing about S.W. ½ S.

Buoyage.—The reefs extending north-west and westward of Mashah island, together with those extending westward of Ras Jibuti, form the eastern side of the main channel to Jibuti bay and are as follows:—A bell buoy, painted black, lies close off the north-west extreme of the Mashah island reefs; and a black buoy at the west extreme of the reef at one mile south-west of the west end of Mashah island.

The following reefs lie on the western side of the main channel to Jibuti bay:—

At about 2½ miles south-westward of the reef buoy just mentioned is an unnamed reef nearly a mile in length and the northernmost of those on the western side of the fairway and about 4 miles N.W. by N. of Ras Jibuti.

Metéore reef, nearly awash in places, lies southward of it with a red buoy marking its south-west extreme.

Penguin bank, a smaller reef, lies southward of Metéore; its east extreme is marked by a red buoy.

Etoile bank, with 1¾ fathoms, lies south-westward of the Penguin, its eastern side being marked by a red buoy. Eastward of it, bordering the fairway, is a bank with from 6½ to 8 fathoms.

Two reefs, awash at low water, lie southward of this bank, forming the western side of Jibuti bay anchorage; the east extreme of the northern one is marked by a red buoy.

The eastern extreme of the detached reef, eastward of the southern reef, is also marked by a red buoy.

Plan of Jibuti Bay on chart 253.

JIBUTI BAY.—Jibuti derives its importance as being the headquarters of the French Protectorate of Somaliland, transferred from Obokh on the northern side of Tajurah reef. The bay affords excellent and secure anchorage in from 7 to 9 fathoms, at about 1¼ miles off-shore, as charted, with less water for small craft nearer the settlement.

The anchorage space is about a mile in extent, with a muddy bottom, good holding ground.

The bay is formed by the projection of Ras Jibuti, which extends a mile or more northward or at right angles to the line of coast, and further protection is afforded by the plateau Héron and the reef on which it stands, extending considerably beyond the point; the western side of the bay is considerably sheltered by two large reefs, dry at low water; the buoyage has been described with those reefs.

General charts 8e and 6b.

Chart 253, Jebel Jan to Shab Kulangárit, with plan of Jibuti Bay. Var. 2° 10′ W.

LIGHTS.—From a white square tower in Fort Ayabeli, about $1\frac{1}{4}$ miles inland, is exhibited, at 105 feet above high water, a *fixed white* light, visible 15 miles.

From a white square tower near the Ambuli river, at 64 feet above high water, is exhibited a *fixed red* light, visible 9 miles; these lights, 1,112 yards apart, are in line with each other, with a pyramid beacon 14 feet high on the shore at the mouth of the river, and with Direction hill $5\frac{2}{3}$ miles southward of the high light in Fort Ayabeli, when bearing S. 6° W., and lead in to the anchorage.

Two *white* lights, of considerable power, are shown in the town, and must not be mistaken for the leading lights.

A *fixed green* light, visible about 2 miles, is shown from a tower 12 feet high at the outer end of the southern jetty.

A *red light* is shown at the railway or Marabout pier when a French mail steamer is expected.

Buoyage has been described with the dangers in the approach.

Directions for Jibuti bay.—There are no pilots at Jibuti, but there is little difficulty in entering in the daytime.

Approaching from the north-eastward the Mashah islands and their lighthouse will be easily identified. The buoyed channel is that westward of the Mashah islands, the outermost buoy being the bell buoy (black) on the north-west extreme of the reefs. Black buoys mark the eastern or port side of the channel on entering, and red buoys the western or starboard side, and from the fairway westward of the south-western Maskali buoy, Direction hill will be in line with the lighthouses and the Pyramid on the south shore of the bay, bearing S. 6° W. will lead into the harbour between the buoys, where anchorage may be taken south-westward of the new pier in about 7 fathoms, mud, or nearer the shore in less depths, as convenient.

Vessels from the south-eastward, and being westward of Arab shoal, may approach southward of the Mashah islands, giving them a berth of about 5 miles; the high lighthouse and other objects will probably be in sight from abreast them; thence steer to give the Plateau du Héron a prudent berth and entering the bay westward of the black buoys marking the western edge of its reef.

At night, the best way in is by the buoyed channel westward of the Mashah islands. From abreast and distant about 2 miles westward of the bell buoy, the leading light, fort Ayabele *white* light, will be in line with Ambuli *red* light, bearing S. 6° W., which being steered for will lead direct into

Plan of Jibuti Bay on chart 253. Var. 2° 10′ W.

the bay westward of the gas buoy, where anchorage should be taken when the jetty light (green) bears S.E. by E. ½ E., in about 7 fathoms as before mentioned.

Current.—Caution.—The captain of the French war vessel *Catinat* reports that during the north-east monsoon season he frequently found a southerly current of from half a knot to 1½ knots running towards the African coast between Ras Asir and Jibuti; other vessels have reported northerly currents, especially between Aden and Berbera, and other places farther eastward. It is not improbable that the same causes which produce the easterly and westerly counter currents in the Red Sea may produce northerly and southerly currents in close proximity to each other in the Gulf of Aden.

Tides.—It is high water, full and change, in Jibuti bay, at from 7 h. to 10 h.; springs rise 9½ feet, neaps 5¾ feet. The tidal streams are scarcely perceptible in the bay.

The railway pier, extending westward from Marabout point, is in an advanced stage of construction, the inner portion being composed of solid blocks of concrete. When complete, there will be at least 5 fathoms at the head, alongside of which there will be accommodation for large vessels; the trains will also start from the pierhead, which, with the rest of the pier, will be about 3ft. 6in. above the level of the highest tides.

Black buoys mark the extreme of the works in progress.

The Southern jetty, extending about 550 yards north-westward from the Jibuti plateau, is 20 feet wide, its surface, hard and level, formed of coral chippings, making an excellent road. Two sets of landing steps have been constructed, one at the head, the other about 20 yards farther in. At dead low water only small boats can land here.

At the head of this jetty is the *green* light before mentioned, and near the inner end is the Residency and flagstaff as already described.

Town.—The town of Jibuti is built on the plateau of Jibuti, which is about 20 feet above the sea level, and overlooks the plain of Ambuli to the southward, on which is built the native village of Bender Gueddid. Jibuti has many well-built stone houses, stores, and shops; it has extended to the plateau du Serpent, on which are many well-constructed houses, some of them visible many miles to seaward. The streets are well ordered and maintained, and the place is said to be healthy for Europeans, notwithstanding the heat, the principal disease being sun-fever.

A small garrison of native troops is maintained.

General charts 8e and 6b.

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° 10′ W.

Government.—The governor of French Somaliland, with the rank of General, resides at a house near the inner end of the southern jetty known as the Residency. He flies a square blue flag, with a small stand of French colours in the head. The port is non-saluting and there are no harbour regulations.

Hospital, &c.—A hospital exists consisting of four small one-storeyed buildings of stone, with 15 beds for whites and 15 for natives, and with power to add 15 more if required. The quarantine establishment is at Maskali island 6 miles northward of Jibuti.

Communication.—Jibuti is in telegraphic connection with Perim, through Obokh, and from thence with all the world; the telegraph cable passes eastward and southward of the plateau du Héron and Ras Jibuti, and is landed at Serpent point; it therefore does not interfere with the anchorage. The Messageries mail steamers call once a fortnight. Communication with Aden is maintained by the steam-vessels of the Compagnie de l'Afrique Orientale. The railway to Harrar, about 160 miles, was completed in 1904.

Coal.—Supplies.—The Messageries Co. keep a stock of about 10,000 tons of Welsh coal, and the Cie. de l'Afrique Orientale about 5,000 tons, but only the latter are available for general supply; the coal is supplied in bulk, from lighters holding from 40 to 100 tons each, of which about a dozen are available, as also the services of a steam-tug and three steam launches if required.

Water can be obtained by boats at the railway pier, the whole town being well supplied by a system of waterworks from the Ambuli river.

Beef, mutton, and fish are plentiful, also fresh bread and rice, the latter imported from Aden. Eggs and poultry are scarce and of poor quality. All other food stuffs are imported and are both scarce and expensive.

Trade.—Since the completion of the railway to Harrar, a large portion of through traffic with the interior, formerly passing through Zeila, has been diverted to Jibuti, and the general commerce of the place increases. Dhows carrying arms and ammunition constantly run from Jibuti to the nearest anchorages on the Arabian coast, principally in the neighbourhood of Ras al Ara and Khor Omeira.

There are mooring buoys for the coal lighters off the jetty.

General charts 253, 8e, and 6b.

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° 10′ W.

The Quarantine station is at Mashah island, p. 426.

Winds.—During the South-west monsoon (June to September) the wind blows regularly from south-west during the day; it attains its full strength towards noon, and very rarely lasts during the night; it is followed either by light southerly winds or by a refreshing north-easterly breeze. The wind blows from about east during the North-east monsoon (October to May), commencing at 9 a.m. or 10 a.m., and freshening towards 2 p.m. The Khamsin is not felt here. Northerly winds are extremely rare at Jibuti, and the sea is nearly always smooth, so that this may be considered the safest anchorage on this coast. On rare occasions, during the South-west monsoon, a short choppy sea is experienced, caused by the deflection of the swell from the opposite side of the Gulf of Tajura entering the bay from a north-easterly direction.

SOMALILAND, BRITISH PROTECTORATES.—The French protectorate of the Gulf of Tajura, which, as before stated, includes the Mashah islands, ceases a few miles south-eastward of Ras Jibuti, the actual line of demarcation being near the eastern side of Lawada bay, about half way between Jibuti and Zeila. From this point the British Somaliland Protectorate commences, and extends as far eastward as long. 49° E., as defined by treaty in 1894.

Charts 6a, and b; Gulf of Aden, sheets 1 and 2.

Inhabitants, &c.—From the neighbourhood of Zeila to Ras al Khyle, southward of Ras Hafun on the eastern coast of Africa, the country is known by the name Bar-e-Samál, and it is divided between two nations, both of which trace their origin from the Arab province of Hadramaut. The westernmost of these extends, or did so when this was compiled, from the borders of the Esa-Somáli tribe, who reside in the neighbourhood of Zeila, to Bander Hashau, a few miles eastward of Burnt island, and is divided into three tribes, viz., the Haber-Gerhajis, the Haber-Awal, and the Haber-Toljaala, so named from their being descended from three sons of Isaak. Isaak crossed from Hadramaut some time after his countrymen had founded the nation to the eastward, which is still the most important of the two families. He settled at the town of Mait, near Burnt island, where his tomb exists to this day. The eldest branch, the Haber-Gerhajis, was put in possession of the frontier mountains to the southward; the other two brothers were placed on either side of them, the Haber-Awal establishing themselves on the low lands from Zeila to Berbera, and the Haber-Toljaala locating themselves at Anteral, Karam, Ankor,

Charts 6a, and b; Gulf of Aden, sheets 1 and 2.

and Hais, four small ports eastward of Berbera. Eastward of Mait, as far as Bander Zaida, is the warlike tribe of the Warsangali, and from thence eastward round Ras Jará Hafun and down to Ras al Khyle the country belongs to the numerous clans of the Mijertein. These are the tribes inhabiting the coast. Although constantly at war amongst themselves, they are usually friendly and obliging to strangers.

From the neighbourhood of Berbera to Ras al Khyle, the Wadi Nogal, or Happy valley, extends in almost a straight line between two ranges of mountains. It is spoken of in the most glowing terms by the natives, and apparently forms their great road for trade the people of Ogahden, Murreyhan, &c., bring all their guns, ivory, and ghi along this valley, as being the safest and least fatiguing route, and are described as a peaceful race, who subsist chiefly by the chase and by their sale of ostrich feathers, myrrh, and ghi.

Trade.—Sheep form the principal export in the western parts of the coast under consideration, and as far eastward as Karam, large flocks being driven down annually and shipped off to Arabia; Berbera is the chief mart during the trading season, viz., from October to March. But, from a commercial point of view, the Mijertein and Warsangali territories are the most valuable, and by far the largest quantity of gum-arabic, luban, and myrrh are collected from the sea coast villages belonging to these tribes, though some of it passes through Zeila.

Westward of the Warsangali range, gum trees are scarce, and though some ports have considerable trade throughout the year, the gums are brought from the Dalbahanti and Ogahden tribes. The Warsangali range itself affords a large supply of frankincense, though but little gum-arabic, and no myrrh.

In the country of the Haber-Gerhajis, the principal articles of trade or produce are ghi, myrrh in small quantities and of inferior quality, luban of the first quality, ivory, ostrich feathers, and gum-arabic, with a small quantity of sheima or orchilla weed, and a still smaller supply of warus, a kind of saffron used by the natives in Yemen to anoint their bodies.

The province and city of Harrar are in Abyssinian territory, but are closely connected commercially with the Somáli country.

Since 1904, Harrar has had direct communication by railway with Jibuti. By caravan route, it is thirteen days' journey, or 83 hours, from Zeila, a distance of about 180 miles, and twenty-two days' journey, or 156 hours, from Berbera, distant about 286 miles. The city is situated in a fertile country, with a

General charts 253, 6a, and 6b.

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° 10′ W.

population of about 36,000. The coffee districts are described as lying amongst a low range of mountains just southward of Harrar. The quantity exported is large, and the quality good.

Besides coffee, Harrar exports white cotton cloths, the cotton being grown in the province of Harrar; a few silk loongis are also manufactured. Cardamoms, gum-mastic, myrrh, a small quantity of manna, saffron, and safflower, with the articles above mentioned, comprise the extent of the Harrar trade so far as regards produce; the most valuable branch of commerce in former times was the export of slaves. The duties levied at Harrar are 10 per cent. on import and export.

Climate.—The climate of the Somaliland Protectorate is naturally dry and uniform. There are two distinct seasons, the hot and the cool, corresponding in period with the European summer and winter; they are determined mainly by the monsoon changes, the hot season being from May to September; the cool, from October to April. During the hot season, there being little or no rainfall, the coastal regions become almost desert. The annual rainfall is about 7 inches. The lowest shade temperature on the coast as recorded at Berbera is about 62° in January; and the highest 114° in July. From November to February inclusive, and sometimes in October and March, north-easterly winds prevail. From April to August inclusive, south-westerly winds prevail, and often of great strength.

Mashah to Zeila. — Extensive bank. — From the Mashah islands south-eastward, a bank extends from the shore an average distance to 14 miles, increasing to 17 miles north-eastward of Zeila, from whence the edge of the bank begins to curve to the southward and close in towards the land, so that off Khor Kulangárit (*lat. 10° 59′ N.*) it is only 8 miles from the shore. The depths between Mashah and Zeila, with the exception of the numerous reefs and shoals presently described, increase gradually from the shore to 20 and 25 fathoms, mud, at the distance named, when a narrow ridge of from 14 to 20 fathoms occurs, extending parallel to the shore for about 18 or 20 miles, and suddenly falling on its seaward side into no bottom at 40 or 50 fathoms, beyond which but few depths have been recorded.

North-eastward of Zeila, at the widest part of the bank, the water deepens very rapidly from 20 fathoms to over 100 fathoms, and 4½ miles outside the 100-fathoms line of soundings, at this part, is the Arab shoal described at page 436. Southward from this, the bank deepens everywhere very rapidly, from 20 to 25 fathoms to 40, 50, and no bottom at 100 fathoms, the narrow shallower bank, near the edge of the soundings, being

General charts 8e and 6b.

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° 10′ W.

peculiar to that part of the bank between Zeila and the Mashah islands.

COAST.—From Ras Jibuti to Zeila, a distance of 24 miles, the coast trends in a south-easterly direction, is low and swampy, thickly covered with mangrove jungle, with several projecting points and bays fronted by a reef, dry in some parts at low water, and with several small islets. Between Ras Jibuti and Mersa Dalwakteah this reef mostly dries at low water and is from a half to 1½ miles wide, but steep-to, having from 5 to 8 fathoms water close to its edge.

Ras Gumarlah, 14½ miles south-eastward from Ras Jibuti and about 10 miles north-westward of Zeila, is a low sandy point of irregular shape, being rounded on its eastern side and projecting westward in the shape of a duck's bill. From the edge of the reef fronting the point, a narrow spit, over which the sea washes at spring tides, extends 5 miles in a north-north-easterly direction; this spit is surrounded by a reef which extends in the same direction about 1½ miles beyond the extreme of the spit. There is a clump of bushes in the bend of the sandy spit, and probably now on other parts of it; between it and the shore reef is a boat channel, available at high water.

Shab Turuhát (*Lat. 11° 34′ N., Long. 43° 25′ E.*).—At 3 miles north-north-east from the extreme of the sandy spit is Shab Turuhat, a dangerous reef about one mile in diameter, and dry in parts at low water, springs; between it and the spit reef are irregular depths of from 3 to 4 fathoms, rocky bottom. Close seaward of the reef, the depths are from 10 to 14 fathoms.

Mersa Dalwakteah.—Immediately westward of Ras Gumarlah is Mersa Daiwakteah, a bay 5 miles wide. A reef, dry at low water, extends from 5 cables to 1½ miles off-shore, between which and Jezírat Dalwakteah, an island connected with the mainland at low water and having a reef extending northward one mile from it, is a very good anchorage for small craft in 4 fathoms, or a little farther out in 7 fathoms; this anchorage is perfectly protected, but can be safely entered only at low water, when the numerous coral reefs to seaward of it are visible at the head of the bay; close to the beach is Lawada, where there are wells of good water.

The boundary line between the British and French protectorates is in the eastern part of this bay.

Reefs.—In the bay between Gumarlah sandspit and the reef off Jezirat Dalwakteah, the general depths are from 10 to 12 fathoms, muddy bottom. Many small and isolated patches exist in this bay, for which *see* the chart.

General charts 8e and 6b.

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° 10′ W.

Moidubis Kebir, about 1½ miles in length, lies about 5½ miles north-west of the extreme of the spit and dries in places at low water; it is steep-to and nearly 5 miles off shore.

Moidubis Seghir is of triangular shape, about one mile long, north-east and south-west at its base towards the shore, and lies 1½ miles southward of Moidubis Kebir, with depths of 13 fathoms between them; it also dries in places at low water.

Gutta tella Ousal (*Lat. 11° 32′ N., Long. 43° 15′ E.*), a reef 5 cables long in a west-north-westerly direction and half that width, also dry at low water, lies 2 miles north-westward of Moidubis Seghir, with from 11 to 13 fathoms between them. Detached reefs lie about 2 cables from Gutta tella Ousal, one on its eastern side and one southward of it.

Islets.—Eastward of Ras Gumarlah, on the edge of the shore reef, which here extends 3 miles in a north-easterly direction, are three islets covered with bushes, named Jezírat Mosheikh, between which and Gumarlah spit is the boat channel before mentioned.

The Mosheikh islets are near the head of the bay formed between the eastern side of Ras Gumarlah sandspit, and the islands of Aibat and Sad-ad-din; this bay is about 4 miles wide and has depths of from 6 to 10 fathoms. With the exception of one rocky patch 1¼ miles eastward of the central part of the sandspit, the bay is apparently clear of dangers, but the shore reef extends off as far as the outermost of the three Mosheikh islets.

Plan Zeila roadstead, sheet 919. Var. 2° 0′ W.

ZEILA ROADSTEAD.—Approaches.—The coast at Zeila, and for many miles north-west of it, is fronted by islands and shoals to a distance of about 10 miles, with the Arab shoal some 10 miles farther off. There are no objects at the latter distance by which a vessel can fix her position, and but few at the lesser distances, so that considerable caution is necessary when approaching it.

Depth.—The road is only suitable for vessels of light or moderate draught; it affords anchorage in about 4 fathoms, with better water in the approaches. The best approach is on either side of Channel reef.

Shoals.—The principal shoals in the neighbourhood of Zeila, some obstructing the approach, whilst others form and protect the harbour, are as follows:—The Arab shoal, in the

Plan, Zeila roadstead, sheet 919. Var. 2° W.

fairway to the port but outside the bank of soundings; Aibat and Sad-ad-din islands with their extensive reefs lying northward of the town; Shab Filfil and the Seagull shoal lying north-eastward of the town; and the Channel reef, nearly in mid-channel between Shab Filfil and the Aibat reefs.

Arab shoal (*Lat. 11° 39′ N., Long. 43° 40′ E.*), with a least depth of 4¼ fathoms, lies about 20 miles north-eastward of Zeila. From the shoalest spot a bank of sand and coral, about 8 cables wide, with 7 and 8 fathoms water, extends about 2 miles eastward and westward about 7 cables. Beyond these limits the depths increase rapidly to the 100-fathoms line, between which and the corresponding limit of the shore bank of Zeila the distance is about 3 miles. The shoal is not easily seen.

Current.—On Arab shoal during two days in February, with light northerly and north-easterly winds, the current set south-eastward from one to 1½ knots an hour. The currents on this coast as a rule set with the prevailing wind, but they cannot be relied on. *See also* **Current.—Caution,** page 429.

Shab Filfil.—Buoy.—Shab Filfil is the easternmost sunken reef of the hard sandbanks extending eastward from Zeila, and lies about 8 miles north-eastward of the town; it is a coral reef of oval form, 1½ miles long, north-west and south-east, by about 9 cables wide, and, though very shallow, never uncovers.

A red conical buoy is generally moored in 6 fathoms about 5 cables southward of the shoal; it marks the northern side of the channel between this and the Seagull shoal.

Seagull shoal.—Buoy.—The northern extreme of this reef lies about one mile south-eastward of Shab Filfil. It is about 2½ miles long, 1½ miles wide, irregular in shape, and never uncovers. A black can buoy generally marks the northern edge of the shoal water extending from it and consequently the southern side of the channel between this shoal and Shab Filfil.

Both these reefs are steep-to on the north-eastern or outer side, the depths increasing rapidly to 20 fathoms. On the inner side, and between them, the depth is from 3 to 7 fathoms. They are at all times very difficult to see.

A third reef, not named, circular in shape and half a mile in diameter, lies one mile southward of Shab Filfil and half a mile westward of the northern end of Seagull shoal.

The passage between these reefs is clear of danger, but owing to the difficulty in seeing the two larger reefs, and the want of leading marks, it should not be attempted unless certain of the buoys being in position.

General charts 253, 8e, and 6b.

Plan, Zeila roadstead, sheet 919. Var. 2° W.

Channel reef.—Buoy.—This is a coral patch half a mile in extent, of from $1\frac{1}{4}$ to $2\frac{1}{2}$ fathoms; it lies about $1\frac{1}{2}$ miles north-westward from Shab Filfil. A black and white conical buoy with staff and ball is generally moored on its south-eastern edge. *See* page 440.

There is a $3\frac{1}{2}$-fathoms patch between Channel reef and Shab Filfil, half a mile from the latter; otherwise the channel is clear and the depths from 6 to 7 fathoms. Between the Channel reef and Aibat reefs, the depths are from 7 to 9 fathoms and the channel clear.

Aibat island.—Beacon.—Aibat island is a low sandy islet about 15 feet in height at its south end, and situated on the west extreme of a reef partly uncovered at low water, which extends 3 miles eastward and one mile northward and south-eastward of the islet. The south end of the islet is steep-to, being on the edge of the reef, and it lies about $8\frac{1}{2}$ miles north of the mosque at Zeila. The surrounding reef is steep-to, with a detached patch off its north-west edge.

From the south-western extreme of Aibat island reef, a tongue of reef extends $1\frac{3}{4}$ miles in a south-westerly direction, with from $1\frac{1}{2}$ to 3 fathoms water.

To render this low island more conspicuous, a white conical beacon has been erected on the northern part of the island; generally it only shows up when the sun is in a favourable position.

Buoy.—The eastern extreme of Aibat reef is usually marked by a black conical buoy, painted with red and white horizontal bands, and surmounted by a staff and ball, moored in 6 fathoms.

Sad-ad-din island forms the northern side of Zeila roads. It is about 2 miles long north-north-east and south-south-west and $1\frac{1}{2}$ miles wide, low and sandy, of coral foundation, and for the most part covered with bushes, the tops of which are about 20 feet above the sea. It is surrounded by a bank of coral, mud, and sand, which uncovers at low water, to about half a mile on the eastern side, and from that to one mile on all other sides. Between its north-western reef and that extending from Aibat island is a channel about $2\frac{1}{2}$ cables wide, with from 6 to 7 fathoms. From the absence of leading marks, caution is necessary in passing between these islands.

Buoy.—On the eastern side of Sad-ad-din, a bank connected with the island and with less than 2 feet water in places, extends $1\frac{3}{4}$ miles in a north-easterly direction. Outside this bank, at $2\frac{1}{4}$ miles eastward of Sad-ad-din, is a narrow detached

Plan, Zeila roadstead, sheet 919. Var. 2° W.

bank 1¼ miles long in a north-easterly direction, on which are depths of from 4¼ to 5 fathoms. Nearly a mile southward of the connected bank, and 1¾ miles eastward from the southern point of Sad-ad-din, is a 2½ fathoms patch surrounded by depths 4 and 5 fathoms. This latter patch is marked at its south-eastern side by a red can buoy surmounted by a staff and black cylinder.

Depths.—Immediately outside a line drawn from the eastern side of Aibat island reef to that of Shab Filfil, in the approach to Zeila roadstead, the depths are from 12 to 20 fathoms; directly that line is crossed they decrease to 9 and 7 fathoms on either side of Channel reef. The general depth between the eastern sides of the reefs surrounding Sad-ad-din and Aibat island, Channel reef, and Shab Filfil, is from 6 to 7 fathoms, but eastward of the banks extending from Sad-ad-din island the depths are irregular, with numerous patches of 4¼ to 5 fathoms, for the avoidance of which reference to the plan is necessary.

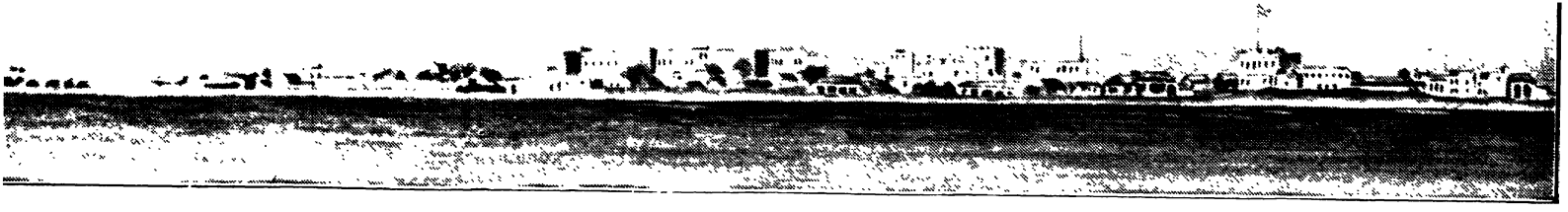
The **available anchorage** ground in Zeila roads between the mainland and Sad-ad-din island, in not less than 3 fathoms, is about one mile wide north and south, by about 3 miles east and west. In the centre there are from 4 to 5 fathoms, mud and sand, good holding-ground. It shoals very gradually on the southern side towards the town, but just within the edge of the 3-fathoms line, on that side, and N.E. by N. 1½ miles from the pierhead, is a patch with only one foot water. On the northern side the edge of the shoal water is steeper.

The best anchorage in the roadstead is in about 4 fathoms, at 2 miles northward of the town During the North-east monsoon a moderate swell sets into the anchorage, increasing generally towards the afternoon.

On the western side of the roadstead the channel is almost entirely blocked by a line of sandbanks, dry at low water, and extending from Ras Takusha, 4 miles north-westward of the town, to the south-western part of the Sad-ad-din banks. All the south-western part of the road is shallow, the average depth being about 2½ fathoms, but 1½ miles south-westward from the south-western point of Sad-ad-din is a 3-feet patch.

The spit on which the town is built continues as a shoal, dry in places at low water, about 1¾ miles wide, and terminating about 3½ miles east-north-east from the town. A wreck has been lying for some years on the south-eastern edge of this shoal. *See* following sketch.

General charts 253, 8e, and 6b.



Zeila from the Anchorage.

Plan, Zeila roadstead, sheet 919. Var. 2° W.

Tides.—Current.—It is high water, full and change, at Aibat island about 7h. 45m.; springs rise from 8 to 9¼ feet neaps from 5¾ to 8¼ feet. Except at springs, the tides are irregular, both as to rise and fall and time of high water. At springs, the flood usually sets westward through the roads, and the ebb eastward, at about half a knot, but this is not to be depended on, as the set is much influenced by the winds.

A strong current often sets along the coast off Zeila as much as 17 miles in the day; the direction is usually, but not always, with the wind.

Directions.—The best time for entering Zeila is in the morning. As the land in the vicinity is low and the shoals extend a considerable distance offshore, there are no distinct landmarks by which a vessel may ascertain her position until close on the reefs; vessels, therefore, bound for Zeila from the north-eastward will do well to make Aibat island, as its beacon, poor as it is, is the best mark. There should be a good look-out aloft; the lead will be found an assistance, and a cast on the Arab shoal is always an excellent guide.

From about one mile outside Shab Filfil, Sad-ad-din island and Aibat island beacon, as well as the town of Zeila, should be visible from aloft; Sad-ad-din, being the higher, is probably first seen. Conical hill, 371 feet high and 11 miles westward of the town, may possibly be a useful mark in clear weather.

The passage between Aibat island reef and Channel reef is the best. From abreast of Aibat island reef buoy, distant one mile, the course is S. by W. ½ W., eastward of the irregular bottom, until the south end of Sad-ad-din bears about West, when a S.W. by W. ½ W. course will lead to the anchorage.

Vessels from the south-eastward, if assured that the buoys are in position, may pass close northward of the Seagull buoy and southward of Shab Filfil buoy, and then steer for the buoy marking the shoal eastward of Sad-ad-din island; when within 1½ miles of it, steer S. W. by W. ½ W. for the anchorage as before.

If intending to enter by the passage between Channel reef, and Aibat island reef, a vessel should on no account shoal to less than 20 fathoms until northward of Shab Filfil.

Aibat island beacon may be steered for, when bearing about W.N.W. until within 5 miles of it, or until the northern extreme of Sad-ad-din bears W.S.W., when the vessel will be in fairway

Plan, Zeila roadstead, sheet 919. Var. 2° W.

northward of Channel reef and may steer S. by W. ½ W. as before directed.

CAUTION.—The shape and colour of the buoys cannot be depended on; their being in position is uncertain, and they are sometimes missing altogether.

TOWN.—(*Lat. 11° 21′ N., Long. 43° 29′ E.*)—This port is under British protection and is of some importance, being the only port on the Esa-Somáli coast, except the French port of Jibuti. Zeila is built on a low sandy spit projecting north-eastward and nearly level with the sea, and consists of many stone houses and some 600 huts; the streets are narrow and tortuous.

Pier.—The Custom-house is at the western end of the town, with a stone pier or jetty extending from it in a north-westerly direction about 500 yards; it is not accessible to boats after half ebb.

Harbour Light.—At the pier-head is exhibited, at 12 feet above high water, a *fixed white* light, visible about 6 miles.

The government is administered by the Acting Consul-General of the British Somaliland Protectorate, usually resident at Berbera, a British vice-consul residing at Zeila. The Consulate is the easternmost house of Zeila, a large three-storeyed building with a red roof and a flagstaff. A detachment of troops is stationed here. The population varies greatly according to season, being as little as 3,000 in the hot season, but in the trading season amounting to about 7,000.

Winds, weather, &c.—The heat at Zeila is excessive during the South-west monsoon, and more than half the natives then move to the highlands in the interior. On board H.M.S. *Penguin*, the temperature in July, at mid-day, was over 100° in the shade. *See* Meteorological Table, page 558.

Supplies.—Water is of indifferent quality and difficult to obtain; the town is supplied partly by brackish wells and partly by water from the watercourse 4 miles south-westward of the town. Sheep may be procured.

Hospital.—Zeila hospital and dispensary is a Government institution and is in charge of a native of India. It is within the fort and contains three wards capable of holding 38 patients in

Plan, Zeila roadstead, sheet 919. Var. 2° W.

all. To meet any infectious outbreak, tent accommodation is resorted to.

Trade.—The inland trade of Zeila has declined since the completion of the Jibuti-Harrar railway, the trade with Harrar having previously been the monopoly of the Zeila-Harrar caravan route. The principal articles of export are coffee, ghi, hides, ivory, pearl-shell, gum arabic, and live stock. The imports are rice and grain, dates, grey shirtings, cotton piece-goods, sugar, and liquors.

Communication.—There is weekly mail communication between Zeila and Aden.

Charts 253, Jebel Jan to Kulangárit, and 6b. Gulf of Aden, sheet 2.

COAST. — From Zeila, the coast has a general south-easterly trend for 78 miles to the neighbourhood of Jebel Almis, and within 2 or 3 miles of Bulhar; it then trends almost due east 39 miles to the entrance of Berbera. The whole extent of this coast is low and sandy near the shore, but rising gradually towards the mountains which bound it in the interior at an average distance of 18 or 20 miles, but which approach within a few miles of the sea westward of Bulhar and again in the vicinity of Berbera; the recession of the mountains from the shore in this latter space forms so deep a curve that, the coast being very low, it has, from the offing, all the appearance of a considerable bay.

In the whole line of coast here described, the only places of the least importance are Bulhar and Berbera. The low lands between Kulangárit and Berbera, a fertile tract perhaps 90 miles long and 40 miles wide, is chiefly occupied by the Haber-Awal tribe. The number of sheep and camels found on these plains is very great.

From Zeila to Ras Maskan, the shore is low and swampy for about 11 miles, with a range of sandhills from 30 to 40 feet high about 2 miles inland; the beach is fronted by a reef and shallow water extending from 5 cables to a mile offshore.

Shab Sheikh Yakub.—A reef of rocks 5 cables in diameter and partly dry at low water, having from 4 to 6 fathoms close around, lies 4 miles offshore with Zeila mosque bearing N. 53° W. 6 miles. A rocky patch of 2½ fathoms, and 4 fathoms close to, lies about midway between it and the shore; also, a 5-fathoms bank, nearly 2 miles south-south-eastward from Shab Sheikh Yakub.

General chart 8e.

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° W.

Ras Maskan (*Lat 11° 11′ N., Long. 43° 34′ E.*) is a low point with a reef of rocks extending upwards of one mile off it. Within the point during the rainy season, December–February, are several pools of fresh water in the bed of a watercourse.

At from 2½ to 3½ miles north-eastward of Ras Masken is a dangerous reef about a mile in diameter and awash at low water, with from 5 to 6 fathoms close to all round, except on its eastern side, where there are 9 fathoms near the reef.

Khor Maduji (*Lat. 11° 6′ N., Long 43° 36′ E.*) is a small inlet 5 miles south-eastward of Ras Maskan and 7 miles north-westward of Khor Kulangárit, with which it is said to be connected by a swamp or backwater. The shore between them is low and sandy, and the range of sandhills, as before described, continues to the south-eastward at one or 2 miles within the beach. This khor is much frequented during moderate weather by small boats from Berbera, Zeila, and Tajura for firewood and wood for house-building.

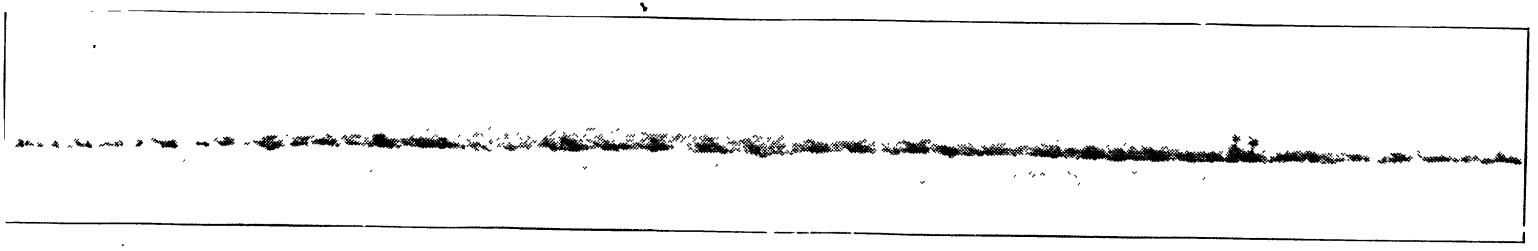
At 1½ miles north-eastward of Khor Maduji is a one-fathom bank on which the sea breaks heavily at times, with 7 fathoms close to.

Shab Maduji is a reef about 2 miles in length by upwards of one mile in width between Khor Kulangárit and Khor Maduji, and from 2 to 3½ miles from the nearest shore. The dry part of the shoal, near the south-eastern end, lies about north-north-east 4 miles from Khor Kulangárit. Seaward of it the soundings are regular, there being 10 and 11 fathoms at 1¼ miles; but, between the shoal and the shore, the depths are irregular.

Khor Kulangárit is a small inlet 7½ miles south-eastward of Khor Maduji, and can only be entered by small boats at high water. A low sandy plain extends to the foot of the mountains, about 20 miles distant.

Shab Kulangárit, a rocky patch awash at low water, with from 9 to 11 fathoms close around, is distant from the shore about 2 miles, with the entrance of the khor, bearing W.N.W. 5½ miles. Just abreast of it is a thick clump of bushes about three quarters of a mile from the beach, resembling a single tree when seen from a distance.

Shoal patches.—On January 23rd, 1890, H.M.S. *Ranger* reported passing between three shoal patches, the most seaward of which appeared to be about 4 miles from the shore; 10 fathoms water was obtained between the patches. The



Off Dungareta. *Palms.*

Chart 253, Jebel Jan to Shab Kulangárit. Var. 2° W.

estimated position of these shoal patches, long. 43° 46′ 15″ E. and about 4 miles from the shore, would place them about 1½ or 2 miles north-north-east from Shab Kulangárit; they may however by wrong estimation be identical with the Shab.

Until further examination has been made of this neighbourhood, vessels should not come within 5 miles of the shore hereabout.

Chart 6b, Gulf of Aden, sheet 2.

COAST.—From Kulangárit to Berbera the coast has not been closely surveyed, but there is no known danger between those places; the shore is generally bold, with from 6 to 7 fathoms water close in; but, in addition to the caution just given, it may be remarked that the fact of its not having been closely examined should induce great watchfulness in approaching it.

Dungareta (*Lat. 10° 41′ N., Long. 43° 57′ E.*) is about 50 miles south-eastward of Zeila. The low coast-line here is for many miles covered with brushwood, but Dungareta, which is not a village but merely the name of a district, may be distinguished by two small groups of palm trees which show out well when seen either from the south-eastward or north-westward; the high mountains at some distance inland are visible in clear weather. There is anchorage from 3 to 4 cables offshore, in about 6½ fathoms.

Sama-wa-nak is about 13 miles south-eastward of Dungareta palms, and 20 miles north-westward of Bulhar, and may be identified by a cluster of date palms growing near the shore. There is anchorage in 6 fathoms, sand, about three quarters of a mile from the beach.

Jebel Almis, at the head of the bight here formed in the coast, is a rugged irregular mountain, the highest peak being rather more than 2,000 feet above the level of the sea and 7 or 8 miles inland. The shore from thence trends eastward to Berbera.

Plan on chart 919, Bulhar anchorage.

BULHAR (*Lat. 10° 23′ N., Long. 44° 24′ E.*) is a considerable town on the shore about 12 miles eastward of Jebel Almis, and 37 miles westward of Berbera. The Government is administered by an official deputed by the acting Consul-General of the British Somaliland Protectorate, residing at Berbera. There is an official Residency, and the time of commercial

Plan, Bulhar anchorage on chart 919. Var. 2° W.

activity is during the North-east monsoon season. The town and coasting trade improve, but the inland trade suffers from the same cause as that of Zeila, viz., the railway communication opened up between Jibuti and Harrar. Formerly, its proximity to the last defile to be passed in coming from Harrar to the sea was of great importance to it. The population some years ago was said to be about 11,000 souls during the trading season, but during the remaining six months of the year dwindling to about 6,000, as the tribes migrate to the highlands in the interior. In 1906, it was said to have largely increased at both seasons, but there is no reliable information available.

Bulhar has a small hospital and dispensary, with quarters for the hospital attendant attached; only about six beds in a single ward are available.

LIGHT.—A *fixed white* light visible about 8 miles is exhibited from the top of the prison at Bulhar, at 22 feet above the sea.

Anchorage.—There is anchorage about half a mile from the shore in 6 to 7 fathoms, within front of the town, bearing between S.E. by S. and S.S.W. When within 2 miles, vessels should approach slowly, as the water shoals rapidly from the edge of the soundings to 10 and 6 fathoms. Within the latter depth it shoals very gradually until within a cable of the beach, and then suddenly from 4 to 1½ fathoms. There is no safe anchorage here during the greater part of the South-west monsoon.

Some conspicuous date trees just eastward of the town, the only trees of any kind near the shore between this place and Berbera, as well as Jebel Almis to the westward, serve to indicate the position of Bulhar from the offing. The town itself is difficult to make out in approaching from seaward, especially if the sun is behind it; the Residency is the first building seen.

Plan 3530, Berbera. Var. 2° W.

BERBERA HARBOUR.—Berbera (*Lat. 10° 26′ N., Long. 45° 1′ E.*) passed into the hands of the British in November 1884. It lies within a low sandy spit extending westward nearly 1½ miles and terminating in Tamar point, which point is steep-to, having 10 fathoms at one cable from it. The harbour thus formed lies in an east-north-east and opposite direction and affords good anchorage and complete shelter from all but westerly winds.

Depths.—The navigable width of the entrance is about half a mile, with a fairway depth of 9 to 10 fathoms, reducing gradually to the head where there is a depth of 5 to

Plan 3530, Berbera. Var. 2° W.

6 fathoms on the northern side at three cables off the pier. There is anchorage in 5 to 10 fathoms over a space a mile in length by from 3 to 4 cables in breadth, over a sandy bottom. *See* Port Regulations, pages 446.

LIGHTS.—On the southern shore of the entrance to Berbera, from a mast near a disused lighthouse is exhibited at an elevation of 49 feet above high water a *fixed white* light, visible 8 miles.

Leading lights.—From a red lantern on the top of a white building near the Custom house and close to the beach, at 20 feet above high water, is exhibited a *fixed red* light.

From a red framework above a white house about 60 yards farther inshore, at 30 feet above high water is shown another *fixed red* light. These lights in line N. 71° E. lead in the fairway up the harbour to the anchorage, but both lights are of such little power that they are only visible 2 miles distant, and sometimes not until within the entrance. The light box of the front light is painted red to make the position conspicuous by day.

A Beacon about 24 feet high stands on the highest part of Tamar point about a cable within its western extreme. The masonry is 12 feet high, white, dome-shaped, and is surmounted by two triangles over each other.

Piers.—The Customs pier fronting the town is 180 feet in length, and is dry at low water.

The Shaab pier, a screw pile construction, connected with the shore by a stone causeway, projects about 500 yards in a north-north-westerly direction from the south-eastern shore of the harbour in front of the Shaab or European town; at its head there is a depth of about 8 feet at low water.

Flagstaff.—Near the inner end of this pier is the Consular flagstaff.

Tides.—It is high water, full and change, at Berbera at 6h. 45m.; springs rise $8\frac{1}{4}$ feet, neaps $5\frac{1}{2}$ feet.

Directions.—Landmarks.—Eastward of Berbera is a high irregular mountain, which on a S.W. by S. bearing has six peaks, all inclined to the eastward; at the apparent length of this mountain to the westward is a very remarkable gap or pass, and a short distance farther westward is Berbera. These marks, together with Jebel Almis to the westward, all tend to make the position of Berbera easy of recognition from whatever direction it may be approached. On nearing the port, the first object to be seen is fort Farhaad, on the hill $1\frac{1}{2}$ miles southward of the town, then the minaret; neither the old lighthouse

Plan 3530 Berbera. Var. 2° W.

nor the beacon on Tamar point are visible at any great distance, but a prominent feature a little eastward of the old fairway to the port but outside the bank of soundings; Aibat lighthouse is a small round hill with white sand on its eastern face; though low, it is the highest hill in the foreground near Berbera.

Approaching Tamar point, the old lighthouse bearing South leads well westward of Tamar point spit; and when the red framework of the rear light is in line with the red box containing the front light on the house near the centre of the Custom-house (a low, long, one-storied white building not readily seen), bearing N. 71° E., they should be steered for. Vessels may then anchor according to draught. The holding ground is good.

At night, the lights may be steered for on the same respective bearings.

Vessels visiting the port from June to September should have plenty of room to veer, as the wind, locally known as the Kharif, then frequently blows from the southward or south-westward, generally with a force of from 3 to 5, but sometimes of from 8 to 9. These winds blow most persistently and generally begin about 10 p.m., but sometimes not until long after midnight, and lasting until noon of the following day; they are frequently accompanied by sand-storms and occasionally last for two days. At 30 miles offshore they are sometimes felt with a force of about 5.

Port Regulations.—Steam-vessels may anchor in any part of the harbour on arrival, provided that they leave a clear passage for others arriving or leaving. All other vessels are berthed by the port authorities. Native craft are usually berthed within half a cable of the Customs pier.

Between sunrise and sunset, vessels may go alongside the Shaab pierhead to land or embark European passengers or luggage, Government stores, live stock, or for watering purposes, but they may not remain alongside unless actually thus employed.

Port dues are charged on all sea-going vessels of 10 tons and upwards, at the rate of one anna per ton if entering the port and discharging or embarking cargo or passengers. If entering, but neither discharging nor embarking cargo or passengers, the rate is two annas for every 100 or part of 100 tons. No sand or stone may be removed from any part of the shore without permission, and no sand or rubbish may be deposited either on the beach or in the harbour.

Quarantine.—The quarantine station is on the sandy spit forming the northern side of the harbour. Vessels arriving

Plan 3530, Berbera. Var. 2° W.

from an infected port must hoist the usual quarantine flag by day, and two red lights, vertical, at the main, by night. All vessels are boarded on arrival by the medical authorities, and no communication with boats or shore is permitted until pratique has been granted.

All shore boats, passenger or cargo, are licensed, and the regulations concerning them are very stringent.

The town of Berbera is at the head of the harbour, and though it has greatly increased in size and importance since it became a British possession, it varies much in population according to the season of the year. The old native town was burnt down by accident in June 1888; the new town is laid out in broad streets at right angles to each other, and the greater part of the houses are constructed of masonry. Fronting the shore, at the head of the port, is the white Custom-house and its pier. Southward of the Custom-house are the police barracks, also white and with a flagstaff. The European town, known as the Shaab, with its pier, is on the south-eastern side of the harbour; it consists of stone houses, gardens, fortified barracks, the Consular bungalow, court-house, and other offices, waterworks, reservoirs, &c. There is a mosque with a minaret, and a white building with a dome at the eastern end of the Shaab, over the tomb of Sheikh Yussuf. The Government is administered by the Acting Consul-General of the British Somaliland Protectorate. A detachment of British Indian troops is quartered here.

Hospitals.—There is a general hospital with three wards, containing 24 beds, but no accommodation for Europeans. An isolation hospital, on a hill about 1½ miles from the nearest house in Berbera, and an infectious diseases hospital at the north-eastern entrance of the town.

Climate.—The climate is by no means unhealthy, though intensely hot during the South-west moonsoon. Whilst a Kharif is blowing (*see* preceding page) it is extremely dry, with a temperature varying between 98° and 104°; on the cessation of this wind, though the temperature falls somewhat, there is a return to the normal conditions of damp and oppressive heat. In the North-east monsoon, it is cool and agreeable by comparison; though with a good breeze outside, it is generally calm in the harbour. Exposure to the powerful summer sun should be avoided when possible.

Trade.—Nearly the whole trade of Berbera is with or through Aden, but there is some small traffic with Calcutta, and with ports of the Red sea and Persian gulf. From October to March, the trading season, the population amounts to 30,000

Plan 3530 Berbera. Var. 2° W.

souls, and during the remainder of the year to about 20,000. Traders from the tribes of the interior commence to assemble in October, and are constantly arriving as late as March, bringing with them the produce of the country, consisting of skins, feathers, ghi, myrrh, gums, coffee, sheep, goats, &c.; these are exchanged for cotton piece goods, rice, dates, sugar, &c. During the trading season, the numerous arrivals from abroad, by sea as well as from inland, cause some confusion in the town, as well as a perfect Babel of languages. The trade of Berbera, and of all the Somáli coast, is conducted by agents called abbans, and anyone wishing to open business must appoint one of these, but the authorities should first be consulted.

The value of exports and imports for the whole Protectorate, but mainly for Berbera, in the year 1906–7 amounted to about 735,000*l.*, showing that during the last five years little or no progress has been made.

Supplies.—No coal can be obtained at Berbera. Fresh water is laid on to the Shaab pier, from which boats may obtain it, but for drinking purposes distilled water is preferable. Fish may be taken with the seine off Tamar point. Berbera has long been one of the chief sources from whence Aden has derived its supplies of sheep and cattle, consequently beef and mutton are always obtainable, but the supply of vegetables is not so well assured.

Communication.—There is constant communication with Aden and Bulhar in the trading season, steamers calling frequently.

Chart 6b, Gulf of Aden, sheet 2.

COAST.—From Ras Tamar at Berbera, the coast has a general east-north-easterly trend for 55 miles to Ras Khanzir. It is low and sandy throughout, and, as far as Ras Kathib, 24 miles from Berbera, the bank fronting the coast, with depths under 100 fathoms, extends from one to 2 miles off. Off Ras Kathib, the edge of the bank is only one mile from the shore. Between Ras Kathib and Ras Khanzir, the bank extends from 2 to 6 miles offshore, and the depths are more convenient for anchoring than either westward of Ras Kathib or eastward of Ras Khanzir. The bottom inshore is of sand and shells; offshore, of sand and coral.

Many hills of various heights rise at a short distance from the shore throughout this range of coast, and are backed farther inland by the Jebel Kalsam range, the highest peak of which,

Chart 6b, Gulf of Aden, sheet 2. Var. 1° 40′ W.

2,620 feet above the sea, lies 10 miles south-eastward of Berbera.

Ras Alweni is a low sandy point about 8 miles north-eastward of Berbera; close off it is a sunken rock (charted as 2 fathoms at about half a mile off). No soundings are found at 100 fathoms beyond 1½ miles from the point.

Seyara is charted about 18 miles north-eastward of Berbera; formerly there were wells of good water about 60 yards from the beach. The place when visited by H.M.S. *Porpoise* in 1902 was found to be entirely deserted and in ruins, and no inhabitants were seen within five miles, nor any sign of wells. Graves were very numerous, showing that it must have been a place of some importance at no distant date.

There is anchorage off Seyara in 10 fathoms, about half a mile from the shore, but affording no protection from winds from seaward. Eastward of Seyara is a hill of the same name, 1,240 feet in height.

Ras Kathib (*Lat. 10° 38′ N., Long. 45° 20′ E.*) is a low sandy point, off which the edge of the bank is again only one mile from the shore. This point must not be mistaken for another of the same name about 115 miles further eastward.

Ras Walhun is a low sandy point, projecting from the centre of the bay formed between Ras Kathib and Ras Sudda, about 9 miles distant from each. From it, a spit with 3 fathoms or less, extends three-quarters of a mile off. Between the point and Anteral is Kamada hill, 235 feet high. Westward of Ras Walhun, the shore is low and sandy, trending about west to Ras Kathib; at 3½ miles inland are several peaks varying in height from 1,000 to 1,250 feet. The depths on this part of the coast are shoaler, the 10-fathoms contour line being 2 miles from the shore, decreasing gradually in depth towards it; the edge of the bank is 4 miles distant and very steep-to.

Anteral is a small village consisting of one stone house and a dozen or more movable huts, about 3 miles south-westward from Ras Sudda; it has some trade with Aden in sheep.

There is tolerable anchorage at from one to 1½ miles off, in 6 to 8 fathoms. Small craft find good shelter from easterly winds in this bay, which is said to recede more from the general coast-line than as shown on the chart.

Ras Sudda (*Lat. 10° 45′ N., Long. 45° 36′ E.*), from which Ras Khanzir is distant 14 miles in an east-north-easterly direction, is a low rocky point, with a reef extending about

General chart 6b.

Chart 6b, Gulf of Aden, sheet 2. Var. 1° 40′ W.

a cable off, immediately outside of which there are depths of 16 to 18 fathoms.

Ras Hamra, 235 feet high, is 7 miles north-eastward of Ras Sudda; it projects but slightly beyond the coast-line.

Karam, a village 4 miles north-eastward of Ras Hamra, and 3 miles south-westward of Ras Khanzir, was one of the most important villages of the Haber-Toljaala branch of the western Somális, from its possessing a tolerable small craft anchorage and being about the nearest point to Aden, distant about 125 miles north-north-west from it.

The value of Karam was enhanced by its being within four days' journey of the country of the Dalbahanta, who, therefore, had a considerable trade through it, but now the principal trade route of these parts is through Berbera.

Karam presents much the same appearance as Anteral, but there are more huts, and in the trading season a few dhows will be found at the anchorage.

The anchorage is westward of the village in from 4 to 10 fathoms, sandy bottom, at from 6 to 8 cables from the shore, where there is tolerably good shelter from easterly winds. A reef and sandspit extend 5 cables from the shore, apparently off the town.

RAS KHANZIR (*Lat. 10° 51′ N., Long 45° 49′ E.*) is a low rocky point with sandy beaches on either side; inland is a range of irregular hills of various heights, Tree hill, 1,775 feet high, being 4 miles southward of the point. The edge of the bank of soundings, immediately off the Ras, is less than two miles.

Ghubbet Ankor.—From Ras Khanzir to Ankor, 25 miles farther eastward, the low sandy coast is slighty concave, forming Ghubbet Ankor. The bank extends farther off-shore near Ras Khanzir than farther eastward, the edge being 5 miles distant at 3 miles eastward of Ras Khanzir, affording better anchorage, with sandy bottom, than farther eastward, where, off Ankor, the edge of the bank is only 2 miles distant.

Khor Shoreh, a shallow lagoon, is about 3 miles eastward of Ras Khanzir. The shore is generally sandy, with bushes.

Ankor (*Lat. 10° 46′ N., Long. 46° 12′ E.*) is another small village on the beach; its shore is fringed by reef for about one cable, and there are depths of 10 fathoms close to it. Landing is bad at any time, and impracticable at low water. A vessel may anchor here about 6 cables from the shore, in about 7 fathoms, sand and coral.

General chart 6b.

Chart 6b, Gulf of Aden, sheet 2. Var. 1° 30′ W.

At 1½ miles southward of the village is Jebel Marreh, an isolated hill, and 4 miles south-eastward of it is the Sugar-loaf hill, 994 feet high. About 14 miles inland is Ankor peak, 3,700 feet in height.

GHUBBET RAGUDA.—Between the point 2 miles eastward of Ankor, and Ras Jilbo, 47 miles farther eastward, the coast recedes 7 or 8 miles, forming the bight named Ghubbet Raguda. The shore is low and sandy, with ranges of undulating hills a short distance inland. Many small villages have come into existence along the shore, and also eastward and westward of it, during the last few years. The bank of soundings off it is narrow throughout, extending only from 2 to 3 miles offshore, and the water is deep. A considerable swell rolls into the bight at times, even in the North-east monsoon, rendering landing dangerous.

Raguda.—In the centre of Ghubbet Raguda, 26 miles eastward of Ankor, is Raguda village, with cocoanut trees near the one solitary stone house; 8½ miles eastward of it, and 4 miles inland, is Finger peak, with the village of Shelao (Shellub) at the mouth of the stream of the same name, fronting it.

About 12 miles westward of Raguda is Wadi Nasuja, a deep valley with a stream of fresh water running through it. Several other small streams in this neighbourhood are formed, and discharge themselves into the sea in rainy weather.

Hais island (*Lat. 10° 54′ N., Long. 46° 54′ E.*) is a small rocky island 22 miles eastward of Raguda and about 5 miles from Ras Jilbo; it lies off, and about two cables from, Jebel Ret, a bluff point 560 feet in height, with which it is connected by a reef.

A reef extends about one cable northward of the island.

Anchorage.—Westward of this reef there is fair shelter for a small craft from the North-east monsoon, in 5 fathoms, indifferent holding ground. On the western side of Jebel Ret and close to the beach is the little village of Hais, fronted for some distance by a reef, affording shelter within for dhows. There is a good landing-place about a cable eastward of the village.

Ras Jilbo, the eastern point of Ghubbet Raguda, is a low sandy point off which the water is very deep and the bank of soundings only extends half a mile off.

JEBEL WARSANGALI.—Aspect.—At 13 miles southward of Hais island, the high range has its western termination in the lofty Pyramid peak, 5,170 feet above the level of the sea; and, 11 miles eastward of Pyramid peak, is the highest part of the range, Jebel Surat, 7,150 feet high. From Pyramid peak

Chart 6b, Gulf of Aden, sheet 2. Var. 1° 30′ W.

the range extends eastward parallel with the shore for about 145 miles, for at least half of its extent presenting a ridge of limestone from 6,000 to 7,000 feet high, with no prominent peaks, its summit varying from 20 to 10 miles inland. At both extremes, and towards the lower ranges of hills between it and the sea, the mountain range descends in steps, forming in most parts perpendicular precipices from 800 to 1,000 feet high. These mountains abound in frankincense and produce a little gum-arabic. The climate is described as most invigorating, and the country abounds in large game, the lion formerly being common in these parts.

Jebel Máit.—About 3 miles within Ras Jilbo is Jebel Máit, 1,300 feet high, which terminates on the shore in a small rocky point.

Máit village, 2 miles north-eastward of Jebel Máit, and nearly midway between Ras Jilbo and Ras Kathib, was the burial-place of a famous sheikh of the name of Isaak, one of the chief founders of the Somáli nation. It stands on a small plain, bounded by the western extreme of the lofty Jebel Warsangali range, which here approaches within 12 miles of the sea.

From Máit is exported a large quantity of the long thin rafter used both at Aden and on the coast in the construction of native houses; the wood is called *mayet,* and from it the place derives its name. The hills immediately over the town afford a large supply of gums, and Máit carries on a considerable trade with Aden and Makalla.

The anchorage off Máit is fairly sheltered from all winds eastward of north-east. Eastward of the village, it is in deep water close to the shore; westward of it, in 7 fathoms at 4 or 5 from the shore. The landing is bad.

Ras Kathib (*Lat. 11° 3′ N., Long. 47° 10′ E.*), about 115 miles eastward of another point similarly named, lies about 11 miles north-eastward of Ras Jilbo. The shore is sandy until within about 4 miles of Ras Kathib, when it becomes cliffy as far as the Ras.

Ras Hambois, a low sandy point 8 miles eastward of Ras Kathib, and the same distance westward of Bander Hashau, may be known by a large single tree on the beach, if it still exists.

MÁIT, Ar-Rabbsh, or Burnt island (*Lat. 11° 13′ N., Long. 47° 13′ E.*) is a barren rock 430 feet high, and covered with guano, which is collected and carried in native boats to the Ash-Shehr and Makalla markets.

It lies about 6 miles off Ras Hambois, the nearest point on

Chart 6b, Gulf of Aden, sheet 2. Var. 1° 20′ W.

the mainland. A reef, with a least depth of 2 fathoms, projects about one cable from its western extreme. There is no water on the island except in rainy weather, when it lodges in pools on the summit of the rock, percolates through, and finds its exit close to the water's edge. On the southern side of the island is a remarkable cove or natural dock capable of admitting a vessel of 300 tons by clenching the ends of a cable through holes in the rock.

The depths in the channel between the island and the main are irregular, varying from 13 to 26 fathoms, and, south-eastward of the island, from 70 to 90 fathoms. The 100-fathoms line of soundings is about 3 miles seaward of the island. The nature of the bottom is chiefly coral, but occasionally sand, or sand and shells.

CURRENT.—During the North-east monsoon, a counter-current occasionally sets eastward along the African coast, between Burnt island and the 49th meridian, at the rate of from half a mile to 2¼ miles an hour.

During the South-west monsoon, an eddy current sets along the African coast to the westward at the rate of about 1½ miles an hour, to near the meridian of Aden. *See also* "Current," pages 25–27.

Bander Hashau (*Lat. 11° 10′ N., Long. 47° 26′ E.*), a small village between Ras Hombois and Ras Sorreh, stands close to the beach, and is the western boundary of Warsangali territory. About 3 miles south-westward of the village is Jebel Burdero, an isolated hill, and 7 miles farther in a south-south-westerly direction is Quoin hill.

Ras Sorreh, 17 miles eastward of Burnt island, is a low bluff point from which the coast-line westward to Ras Kathib, a distance of 23 miles, is slightly convex. For 3 miles from Ras Sorreh the coast consists of low cliffs; from thence, in both directions, it becomes low and sandy, and at a short distance from the beach is scantily covered with bushes. A range of undulating hills lies close inland, with occasional spurs from them approaching the sea. Ras Sorreh is the western limit of Ghubbet Kalwait.

Ghubbet Kalwait.—From Ras Sorreh the coast trends south-eastward about 11 miles and then easterly for nearly the same distance to a point between which and Ras Sorreh is the bay known as Ghubbet Kalwait.

Wakdaria village is situated to the eastern part of this bay: a vessel may anchor off it in from 8 to 5 fathoms, but care is necessary as there is a projection of the reef here and it is not easily seen; there is good landing westward of this projection.

General chart 6b.

Chart 6b, Gulf of Aden, sheet 2. Var. 1° 20′ W.

About 9 miles beyond the eastern point of Ghubbet Kalwait is Ras Galweni. The shore is low and sandy the whole of this distance, and thinly covered with bushes at a short distance inland. Between the high Warsangali range of mountains and the beach are ranges of undulating hills. A short distance eastward of Ras Sorreh, the 100-fathoms contour line is 6 miles from the shore, but it soon approaches the land again, and, for the last 17 miles of this portion of the coast, it is an average distance of 3 miles. The 10-fathoms line is from 7 cables to one mile off-shore. The general nature of the bottom is sand, coral, and occasionally shells.

Chart 100b, Ras Galweni to Ras Hafun, &c.

Ras Galweni (*Lat 11° 8′ N., Long. 47° 55′ E.*) is a low sandy point, to which a spur of the mountain range slopes. The bank of soundings extends a little more than 3 miles from the shore, the 10-fathoms contour line being about one mile distant, from which it rapidly falls off into 100 fathoms. The bottom is chiefly sand and coral.

A small village exists one mile westward of Ras Galweni, and the white fort there makes it easily seen. Anchorage may be taken off it in about 7 fathoms at 8 cables from the shore, but the landing is bad. Between Ras Galweni and Bander Laskhorai the coast is low, sandy, and backed a short distance inland by ranges of undulating hills.

Ras Lasmaan is another low sandy point 18 miles eastward of Ras Galweni; on it are several small sandhills and close eastward a khor of brackish water, little more than a swamp. About 2½ miles south-westward of the point is Bander Laskhorai.

Plan, Bander Laskhorai anchorage, on chart 100 b.

BANDER LASKHORAI (*Lat. 11°10′N., Long. 48°11′E.*), the principal town of the Warsangali tribe, consists of three forts and two large villages, the central fort lying between the two villages and the whole covering a space along the shore of about three-quarters of a mile. A bluff just northward of the villages is a conspicuous feature in making Bander Laskhorai. At this place there is a large trade in gums.

In 1904, a small pier was constructed of coral rock for the convenience of landing and embarking troops; it projected from the shore at about half a mile north-eastward of the northern village, and had sufficient water alongside at all times for boats; so long as it is maintained in repair it should afford good landing.

Anchorage.—At about 4 cables north-west from the southern village is good anchorage in from 6 to 9 fathoms,

Plan, Bander Laskhorai anchorage, on chart 100b. Var. 1° 20′ W.

sand, with occasional patches of soft rock; here but little swell is likely to be experienced during the North-east monsoon, and the depths decrease gradually towards the shore. The best landing, irrespective of the pier just now mentioned, at high water is abreast of a high tower in the northern village; and, at low water, near the fort at the southern end of the southern village.

Supplies.—Cattle, water, and firewood are procurable at the villages; the natives appear to be friendly, and good seining may be had.

Tides.—It is high water, full and change, at Bander Laskhorai at 7h. (approx.).

Chart 100b, Ras Galweni to Ras Hafun.

COAST.—Ras Gahm is another low sandy point 9 miles north-eastward of Ras Lasmaan; off it, anchorage depths extend about 1½ miles, but the soundings drop suddenly to 100 fathoms. There are several inlets from the sea at the point, at the head of which the water is fresh after rain, and there is also a fresh water lagoon. On the western side of the point are three small villages and Bander Gahm fort, from whence gums are exported.

The anchorage directly off these villages is bad, the depth being 12 fathoms close in-shore, and the bottom rocky.

A cluster of ruins and palm trees about 6 miles north-eastward of Bander Gahm form a rather conspicuous mark along this line of coast.

Ras Dofdillah.—About 9 miles eastward of Ras Gahm and the same distance westward of Ras Adaddo is Ras Dofdillah, a low sandy point, on which is an isolated table hill 600 feet in height.

Durduri.—Half way between Ras Dofdillah and Ras Adaddo is the village and fort of Durduri, with a fresh water khor close westward of it.

RAS ADADDO (*Lat. 11° 20′ N., Long. 48° 39′ E.*).—This rocky point is about 300 feet high; at the back of which is a cluster of hills 600 feet in height, between which and the village of Elaiya, 15 miles farther eastward, a black table land of basalt and volcanic rock about 300 feet in height approaches close to the sea. From Ras Adaddo westward to Ras Gahm, a distance of 18 miles, the shore is generally low, with an occasional hill, and bounded in the interior by the Warsangali range.

Two forts about one mile westward of Ras Adaddo are an excellent landmark when seen from the north-eastward.

The Coast from Ras Adaddo trends in an easterly direction for 39 miles to Ras al Hamar; it is slightly concave, forming a

Chart 100b, Ras Galweni to Ras Hafun. Var. 1° 0′ W.

bay generally low with occasional hills, and backed by the high Warsangali range, previously described; its eastern limit is about 20 miles southward of Ras al Hamar. The soundings on this portion of the coast are regular, but deep; the 10-fathoms line is from half a mile to one mile from the shore, and the edge of the bank is from 1½ to 4 miles, being very steep; the soundings, in some parts, falling rapidly from 20 to 100 fathoms. The bottom is rocky close inshore; sand, and sand and shells farther out.

Elaiya village is easily picked up, lying as it does at the eastern end of the black volcanic hills just described, and may be recognised by its two whitewashed mud forts about 100 yards apart, which, with a rather large cluster of huts, go to make up the village, behind which is a ridge about 200 feet high, where are numerous cairns said to have been erected by a previous race to that now inhabiting the country. About three-quarters of a mile westward of the village is a nullah, which, during rains, must form a large watercourse; its neighbourhood is comparatively fertile, and the flocks are in better condition than at most parts along this coast.

Anchorage.—The village may be approached with the western tower bearing S. by E., and anchorage taken on this bearing in 6 fathoms, about 5 cables from the shore; farther north-eastward there is an appearance of shoaler water. The landing is exposed and bad. Anchorage all along this coast may generally be found in from 5 to 10 fathoms, close to the shore, but it is indifferent, the bottom being sand and rock, and quite exposed.

Bander Zaida, or Kao (*Lat. 11° 15′ N., Long. 48° 59′ E.*).—Bander Zaida is a small town and fort 6 miles eastward of Elaiya and 12 miles westward of Bander Kasim; it is about on the dividing line between the Warsangali and Mijertein tribes. The 10-fathoms contour-line is nearly one mile from the shore at this place; the depths then rapidly increase to 100 fathoms. Anchorage is indifferent, the bottom being sand and rock.

Boundary.—The British Somáliland Protectorate ends near Bander Zaida, in long. 49° E., which meridian is the boundary between the British and Italian protectorates. *See also* p. 431.

As already stated, the coast in this vicinity is backed by a low broken ridge of hills. At 3½ miles eastward of the town is a stream of water, fresh in the rainy season, and navigable for boats for about 3 miles; and both eastward and westward of the town are small streams after heavy rain.

General charts 100b, and 6b.

Chart 100b, Ras Galweni to Ras Hafun. Var. 0° 50′ W.

Inhabitants.—The Warsangali tribe, otherwise known as the Sangali Somáli tribe, who inhabit the coast from Bander Hashau to Bander Zaida, are divided into several clans; they are a powerful and warlike people, but are friendly and obliging to strangers. Their country is the plateau of limestone mountains already described, precipitous on their northern side, but sloping gradually to the south, together with the undulating ranges, intersected by ravines, and thickly wooded between the mountains and the sea, and also the plains on the southern slope of the mountains. The belt of the level ground near the sea is thinly sprinkled with bushes growing on a plain of white sand.

Frankincense, myrrh, sumuk or gum-arabic, shench (orchil), and ghi, form the export of this tribe; also felleh-felleh, a peculiar kind of gum, which is shipped to Aden in large quantities.

BANDER KASIM, or Bosasa, a town and anchorage 12 miles eastward of Bander Zadia, consists of about 100 huts and 5 small forts. It is the principal town of the Mijertein Somális and has a large trade in gums, &c. At 1½ miles westward of the town is the bed of a broad stream, which, after heavy rains, discharges a large quantity of water into the sea.

Anchorage.—A coral bank, dry at low water, extends half a mile off the town; outside of it is moderately good anchorage with offshore winds, in from 6 to 8 fathoms, sand.

Landing.—There is good landing by passing through a channel in the coral reef, which channel is generally indicated by two or three dhows being anchored in it.

Supplies.—There are wells in all the forts, from which good water may be obtained; sheep and firewood are procurable.

RAS AL HAMAR (*Lat. 11° 21′ N., Long. 49° 19′ E.*).—A prominent sharp rocky point about 300 feet high, is the north-western termination of a range of hills, about 9 miles long and with heights varying from 800 to 1,500 feet. Depths of 4 and 5 fathoms will be found nearly one mile northward and north-westward of the point, with from 8 to 10 fathoms beyond that distance.

Khor Maraio.—On the western side of the point is an inlet into which a stream of fresh water runs after heavy rains. The bed of this stream is dry in the dry season, but water is always procurable by digging.

General chart 6b.

CHAPTER X.

AFRICAN COAST.

RAS AL HAMAR TO RAS ASIR AND RAS HAFUN.—SOKÓTRA AND ADJACENT ISLANDS.

(Lat. 11° 20′ N., Long. 49° 19′ E., to Lat. 12° 50′ N., Long. 51° 40′ E.)

VARIATION IN 1909.—Decreasing 3′ annually.

Chart 100b, Ras Galweni to Ras Hafun, &c.

COAST.—From Ras al Hamar, described in the preceding chapter, the coast trends east-north-eastward about 16 miles to Ras Hantara, the slight indentation between them being divided into two bays by the rocky point Ras Aburgaba. The shore between is sandy and backed by a range of hills from 800 to 1,500 feet in height, but near Ras Hantara they rise to 5,000 feet in the Jebel Hantara range.

Ras Aburgaba.—Just westward of Ras Aburgaba are two villages, and Bander Baad fort, at which sheep and water are procurable. With the exception of a small 2-fathoms bank half a mile northward of the western village, the depths are regular, increasing off-shore gradually to 20 fathoms, sand, and from thence rapidly to the 100-fathoms line.

Between the villages and Ras Aburgaba there is good anchorage in 9 or 10 fathoms, about 1½ miles off-shore, but without protection from any but off-shore winds.

Ras Hantara (*Lat. 11° 17′ N., Long. 49° 34′ E.*), a high rocky cape, is the termination of Jebel Hantara, the range of lofty table mountains just now mentioned, which are thickly covered with the frankincense tree, and 5,000 feet in height. Fair but entirely exposed anchorage, with good holding-ground, may be found off the point.

The shore between Ras Hantara and Ras Korai, 9 miles farther eastward, is sandy and covered with bushes, with depths of 20 fathoms and less extending about 2 miles off-shore.

General charts 100a, 6b, and 6a.

Chart 100a, Ras Galweni to Ras Hafun, &c. Var. 0° 40′ W.

Ras Korai is another high rocky cape, the termination of a similar range of lofty table mountains, stretching away in an east-south-easterly direction, and rising to a height of 4,600 feet above the sea; the sides of these mountains are clothed with large frankincense trees. The soundings off the cape are deep, and the 100-fathoms contour line is only about one mile distant from the shore. On the western side of the cape is Borch village and fort.

From Ras Korai to Bander Maráyeh, a distance of 45 miles farther eastward, the coast-line is slightly concave, with small projecting rocky points and bays between them. The shore is bold, there being no shallow water except off Bander Khor, below mentioned. The 100-fathoms line of soundings varies in distance from 2 to 6 miles from the shore, with a sandy bottom.

Aspect.—Between Ras Korai and Bander Khor, Jebel Haismut rises 3,800 feet above the sea, only a mile or two inland; and about 8 miles eastward of the khor commences a ridge of limestone mountains from 1,500 to 3,000 feet in height, closely bordering the sea coast, and terminating eastward in Jebel Maráyeh, presently described, of which these mountains may be considered the western branch.

Gandalo or **Kandala** is a small village situated 8 miles east of Ras Korai. There is anchorage about one mile off it in from 6 to 8 fathoms.

BANDER KHOR (*entrance, Lat. 11° 32′ N., Long. 49° 54° E.*) is 12 miles eastward of Ras Korai. A bank, before mentioned, of from one to 3 fathoms extends off the mouth of the river, for nearly a mile, outside of which there is good anchorage in from 6 to 10 fathoms with off-shore winds.

The town is 4 miles from the sea on the banks of the river, the mouth of which is dry at low water, but the river is navigable for small boats up to the town at high water. On the western side of the entrance is a small village and fort, and 2 miles south-westward of the fort are some ruins and small lagoon.

During the rainy season the river discharges a quantity of water; the entrance may be known by a low white sandhill about a mile eastward of it and close to the beach, and by its being between two high ranges of mountains; the land one mile inshore is tabular and about 400 feet above the sea.

A considerable trade is carried on here with gums, which trade, as at Bander Maráyeh, to the eastward, is chiefly enjoyed

Chart 100a, Ras Galweni to Ras Hafun. Var. 0° W.

by banyan traders. Here, as at all the towns on this coast, sheep, firewood, and water may be procured.

Durbo.—About 24 miles eastward of Bander Khor is Ras Durbo, a small rocky point scarcely distinguishable from any part of the coast, and 3 miles eastward of it is the village and port of Durbo.

BANDER MARÁYEH, (*Lat. 11° 43′ N., Long. 50° 27′ E.*) is the principal village on this part of the coast, but it is almost deserted in the hot season. The town lies on the beach at the base of Jebel Maráyeh or immediately at the foot of a red precipitous hill about 900 feet high, which has a large natural hole through it close to the summit; it has five forts. North-eastward of the town is a mangrove swamp and the bed of a watercourse.

A considerable trade in gums is carried on from here about September, principally by banyan traders.

From a distance it may be found by steering for Jebel Maráyeh, which is easily distinguished by its hummock shape, though there is another conspicuous barn-shape peak 18 miles westward of Jebel Maráyeh, which might be mistaken for it by a vessel to the westward of her reckoning.

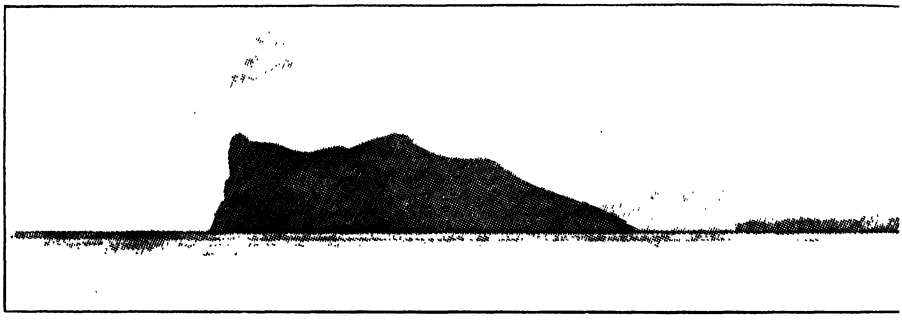
Anchorage off the town is good, in from 5 to 10 fathoms, sand, at from 5 to 8 cables off-shore, with the mosque bearing S.S.E. ½ E. The soundings increase gradually to 20 fathoms at 1¾ miles from the beach, after which they become irregular with overfalls.

Supplies.—Good water may be obtained from a well 2 miles inland; cattle and firewood are generally procurable.

Jebel Maráyeh, a mountain peak 4,000 feet in height; its summit lies about 3 miles south-south-west from the town, being the spur of a noble range of limestone mountains, covered with frankincense trees, extending inland in an easterly direction, and attaining a height of 5,000 feet; as previously described, a branch of the same range also extends westward along the coast from Jebel Maráyeh for about 23 miles, varying in height from 1,500 to 3,000 feet.

From Bander Maráyeh, the coast trends north-north-eastward for about 12 miles to the western sandy point of Filuk. Within this space are the two small villages, Galseh and Gahseli, close to the beach, each with forts, but having bad anchorage off them. About 3 miles beyond Gahseli is Bander Filuk.

Bander Filuk (*Lat. 11° 49′ N., Long. 50° 31′ E.*) is a small fort and village close to the beach, about 7 miles north-eastward of Bander Maráyeh and 5 miles southward of the sandy point



Ras Filuk, *East 7 miles.*

Chart 100a, Ras Galweni to Ras Hafun. Var. 0° 30′ W.

of Filuk. Immediately northward of the village is the entrance to Khor Filuk, a lagoon about 10 miles in length and covered with mangrove bushes, with only a low narrow ridge of sand between it and the sea.

Anchorage.—The anchorage off Bander Filuk is in 6 or 7 fathoms, with the fort bearing east: a good scope of cable is necessary to prevent dragging the anchor off into deep water, into which the bank suddenly falls at 4 or 5 cables from the beach.

The low and rounded sandy point of Filuk is about 6 miles south-westward of Ras Filuk proper; off it, a depth of 5 fathoms will be found at one mile from the shore, and a coral bank of 20 fathoms and less extends nearly 2 miles off-shore.

RAS FILUK (*Lat. 11° 57′ N., Long. 50° 37′ E.*), or more properly Ras-al-Fil, also the Mons Elephas of the Romans, so called from its resemblance in shape to an elephant, is a prominent hill 800 feet in height, 8 miles westward of Ras Alula, and, whether viewed from eastward or westward, it has the appearance of an island, the land about it being low. It is generally called by the natives Ras Belmúk, and may be seen at a distance of 40 miles in clear weather. The water is deep off it, there being 18 to 20 fathoms. In the valley, on its eastern side, is a salt water lagoon and the bed of a water-course.

Anchorage.—Close westward of Ras Filuk is a small but deep bay, affording shelter from easterly or southerly winds, with good anchorage in 5 fathoms water, with the point bearing N.E. by E. about 6 cables. From this position, the depths are regular towards the point, but, to the southward, reefs extend some distance off-shore. The depths are from 8 to 10 fathoms a little farther out.

Plan, Bander Alula anchorage on sheet 671.

RAS ALULA (*Lat. 12° 0′ N., Long. 50° 46′ E.*) is a low, sandy but prominent cape, lying 8½ miles eastward of Ras Filuk, the shore between the two being low and sandy. The plain from Ras Alula gradually ascends until it reaches the high range of mountains in the interior.

Khor Galweni.—About 8 cables distance from Ras Alula, on its south-western side, is the narrow entrance to Khor Galweni or Great lake, a lagoon covered with mangrove bushes nearly over its whole extent. Boats can enter at all times of

Plan, Bander Alula anchorage on sheet 671. Var. 0° 30′ W.

tide, but large dhows must wait for high water. A stream falls into the khor at its southern extreme, which, during the rainy season, must be somewhat deep, the bed of the chor being 250 feet in depth by 900 feet in width. In the dry season the river is navigable for boats 3 to 4 miles from the sea, and farther inland there are pools of fresh water in its bed.

Bander Alula, a village and anchorage, lies about 1½ miles south-westward of Ras Alula. The village consists of about 200 houses, of which three are of stone, the largest being occupied by the Sheikh; there are also several ruined towers and a large cemetery near the southern end of the village. The water at the village is bad, but cattle, except after periods of drought, and firewood are procurable. Fish may be taken with the seine on the western side of the spit; sharks are numerous.

Anchorage.—There is anchorage, sheltered from easterly winds, in 8 or 9 fathoms on the edge of the coral ledge, at from 3 to 4 cables from the shore, with the Sheikh's flagstaff bearing S.E. and Ras Galweni, the western point of entrance to the khor, N.E. by E. ¼ E. Landing is apparently easy.

Trade.—The exports are gum arabic, incense, myrrh, dried hides, ostrich feathers, ivory, pearls, sponges, &c. The imports are cotton and silk stuffs, rice, sugar, tea, &c. The trade is carried on mainly through Aden.

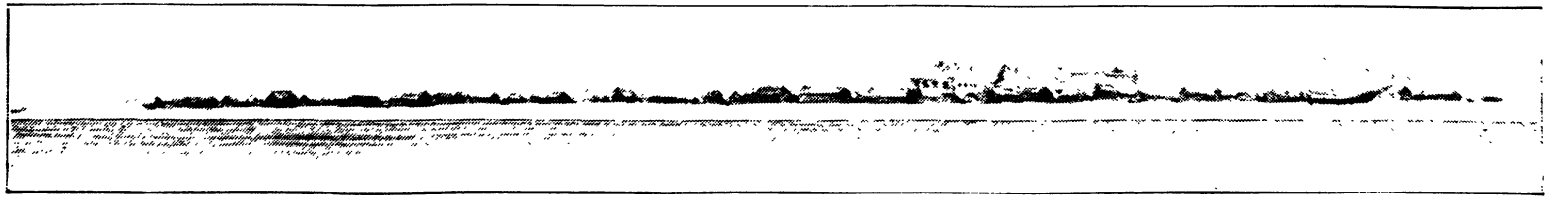
It is stated by the natives that coal exists some few days' journey up country from Alula.

Tides.—It is high water, full and change, at Bander Alula, at 6h. 45m.; springs rise 6 feet.

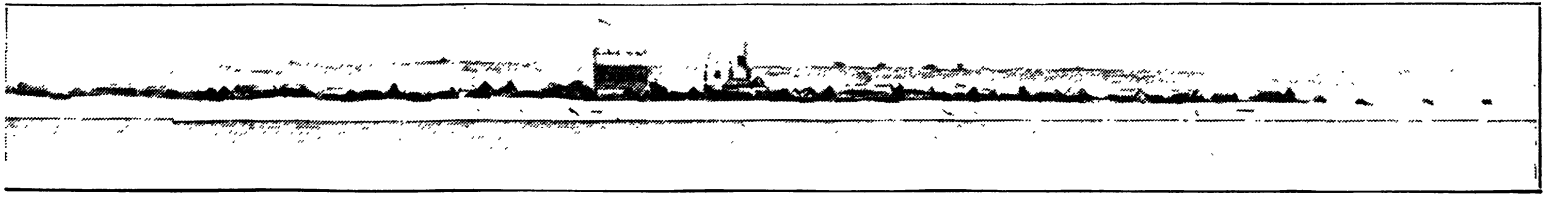
Chart 100a, Ras Galweni to Ras Hafun.

COAST.—From Ras Alula, the coast has an east-south-easterly trend for 31 miles to Ras Asir or cape Guardafui, as it is frequently called, the shore throughout following nearly a straight line, through there are a few slightly projecting rocky points forming small bays between, but no known dangers exist. The depth increases rapidly from 10 fathoms to the 100-fathoms contour line at the edge of the bank off Ras Alula, from which it is distant less than 2 miles; the contour line is distant 6½ miles off Ras Boleh, and closes again to about 2½ miles northward of Ras Asir.

At 7 or 8 miles eastward of Ras Alula, the mountains, from 1,800 to 1,600 feet in height, are generally close to the sea,



Bander Alula from the North-westward.—Eastern part of Town.



Bander Alula from the North-westward.—Western part of Town.

Chart 100a, Ras Galweni to Ras Hafun. Var. 0° 20′ W.

with the exception of two or three intervening spaces where the shore is sandy and covered with bushes.

At Moya Boleh, about 6 miles eastward of Ras Alula, and which may be distinguished by its date palms, is a lagoon and several wells of excellent water about 100 yards from the beach; water can be obtained by digging holes in the sand near the wells to a depth of 3 or 4 feet.

Baraida (*Lat. 11° 53′ N., Long. 51° 2′ E.*), half way between Ras Alula and Ras Asir, is a village on the sea shore at the foot of the mountains which here forms the coast line; it consists of about 200 huts and the large white fortified stone house of the Sultan, which renders it conspicuous from seaward.

There is good anchorage about 4 cables north-westward of the Sultan's house in about 4½ fathoms. The landing is bad, but is generally practicable westward of the village. The natives are civil, but should not be too implicitly trusted. A few miles westward of Baraida is a salt water lagoon.

Plan, Oloch and Damo anchorages, chart 100a.

Oloch and **Damo.**—Oloch (*Lat. 11° 51′ N., Long. 51° 11′ E.*) is a small village and fort, on the shore about 8 miles eastward of Baraida, and with Oloch peak, 1,216 feet high, about one mile inland and south-westward of it.

Damo is a similar village and fort 1½ miles farther eastward and 3 miles westward of the extreme eastern point of Ras Asir.

There is good anchorage in the bay off or between these villages in 8 or 9 fathoms, at about half a mile from the shore, well protected from southerly winds, and with a fair landing-place at each village, but especially in a small bight about 4 cables eastward of Damo, which is also a good place for hauling the seine.

Supplies.—Turtle may be obtained from the natives at this anchorage in the season; bullocks and small sheep, brought from Wadi Tuhom, may also occasionally be purchased. Fish are plentiful and good.

RAS ASIR or CAPE GUARDAFUI (*Lat. 11° 50′ N., Long. 51° 16′ E.*), the north-eastern point of Africa, is a precipitous rocky cape 837 feet in height, of a whitish-brown colour, and when seen from the south-eastward appears with a moderate slope towards the sea.

The land westward of Ras Asir is a level ridge, the sand-hill 3 miles distant from it being apparently the end of it.

General charts 6a and 597.

Chart 100a, Ras Galweni to Ras Hafun. Var. 0′ 20′ W.

This sandhill is in no way remarkable when seen from the south-eastward, being but little above the ridge. About 3 miles farther westward is a steep bluff, forming the eastern extreme of a range of hills facing the northern coast, and not far back from it. The cape is frequently enveloped in thick haze, rendering it deceptive in estimating its distance.

Approaching from the north-eastward, Ras Asir may be known by the light-coloured sand on the top and by the sandy bay westward of it. The cape is steep-to, with 12 fathoms water close in-shore, and soundings extending 18 miles eastward, with a gradually increasing depth to the 100-fathoms line; northward of Ras Asir, as already stated, that line is only 2½ miles from the shore.

Current.—Great care is necessary in making Ras Asir from the southward during the South-west monsoon, the current setting up the coast strongly to the northward, and turning close round the cape to the westward; but, at a short distance from it, continuing its course northward and north-eastward.

See **Directions** for approaching Ras Asir, with remarks on currents, sea temperature, soundings, &c., at pages 15, 26, 29, 44, and views from the southward on charts 6a and 100a, also views on opposite page.

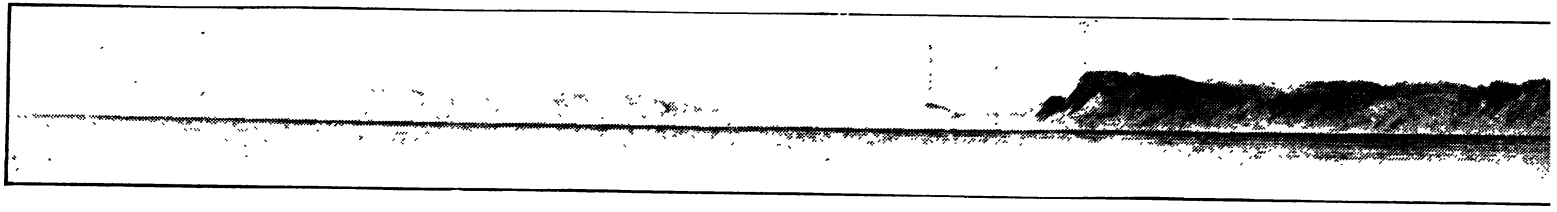
Tides.—It is high water, full and change, at Ras Asir, at about 6h. 15m.; springs rise 6 feet, neaps 4½ feet.

Anchorage.—In the bay immediately westward of Ras Asir is good temporary anchorage off Damo and Oloch as above described.

COAST.—From Ras Asir the coast trends southward for 84 miles to Ras Hafun, with Ras Jard Hafun and Ras Ali Bash Kil between them; the former at 10½ miles, and the latter at 42 miles southward of Ras Asir, or about half way between it and Ras Hafun. The 100-fathoms contour-line of soundings lies nearly 30 miles from the shore eastward of Ras Jard Hafun; from thence southward it closes in towards the shore until off Ras Ali Bash Kil it is only 11 miles distant, and off Ras Hafun from 11 to 13 miles. The water everywhere shoals gradually towards the shore, though off each of the principal points depths of from 20 to 10 fathoms will be found very close in. Full particulars of the precautions necessary in the approach to and navigation of the coast will be found at page 44 of this work.

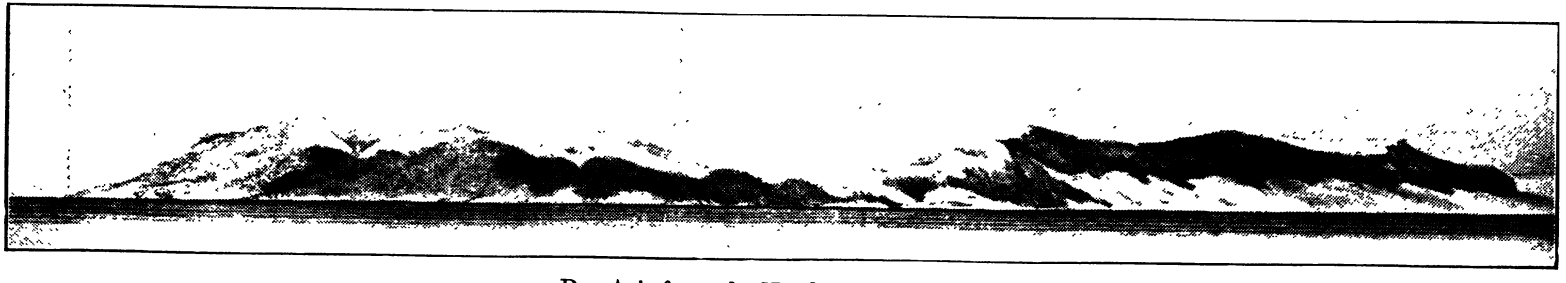
General charts 6a and 597.

Ras Asir. *Sandhill.* *Oloch.* *Steep bluff.*



Ras Asir from the North-westward, *distant 16 miles.*

Ras Asir. *Ras Jard Hafun.*



Ras Asir from the Northward, *distant 8 miles.*

Chart 100a, Ras Galweni to Ras Hafun. Var. 0° 20′ W.

Wadi Tuhom is a fertile valley 6 miles southward of Ras Asir, full of large mimosa trees, and with a stream of water running through it. From near Ras Asir the shore is sandy to Wadi Tuhom with the exception of a small cliff about midway. Near the entrance of the stream, which is apparently blocked up in the dry season, are numerous habitations, and a cliff about 160 feet in height extends nearly one mile southward from it, beyond which the shore is again sandy to Ras Jard Hafun.

RAS JARD HAFUN or SHENARIF (*Lat. 11° 40′ N., Long. 51° 14′ E.*).—Ras Jard Hafun is situated 10½ miles southward of Ras Asir and is the north-eastern extreme of Jebel Gúraleh, the bluff termination of lofty table land 2,900 feet in height. This table land on its seaward face falls precipitously for about 400 feet, and immediately over the cape the ground from the foot of the precipice is much broken in its slope to the sea, with deeply-scored sides and some remarkably formed rocks. The cape itself is rounded, rocky, and bold, there being from 10 to 16 fathoms water close to. It is in appearance a remarkably bold and rugged headland, especially when seen from the south-eastward. The land about it and to the southward is dark, and in great contrast with the whitish-brown colour of that between it and Ras Asir.

From Ras Jard Hafun northward, the high table land of which it is the extreme takes a north-westerly direction for about 6 miles, at which distance there is a deep ravine, with a sharped-peaked hill 2,760 feet in height northward of it. Between this peak and Ras Asir the hills recede still farther from the coast, the space between being occupied by an undulating light-coloured ground resembling hard sand, and rising in a gradual slope from the sea. It is this receding of the high land, combined with the light colour of the slope intervening between it and Ras Asir, that causes the difficulty of making out any land northward of Ras Jard Hafun at night, which has led to many disasters. *See* sketch on charts 6a and 100a.

Quoin peak (*Lat. 11° 34′ N., Long. 51° 4′ E.*), about 3,000 feet in height, 11 miles south-westward of Ras Jard Hafun and 3 miles inland, is a conspicuous mark from the southward; its bluff is on its north-eastern side, and may be seen at a great distance in clear weather. There is also a rounded sandhill near the shore about 17 miles southward of Ras Jard Hafun, with a large tract of sand extending northward of it and well up the hills at the back; this also is a good mark, it being the only white sand in the neighbourhood. From Ras Jard Hafun, and including Quoin peak, the Jebel

General charts 100a, 6a, 597, and 1012.

Chart 100a, Ras Galweni to Ras Hafun. Var. 0° 20′ W.

Gúraleh range stretches away in a south-westerly direction, and attains a height of 5,000 feet.

Khor Abdihán.—At 12 miles south-westward of Ras Jard Hafun and close to the beach is Khor Abdihán, a salt water lagoon, with fresh water in the upper part, where it is fed by a stream running down the valley. Just southward of the khor is the small village named Eyudur.

Ghubbet Binna is the bay on the north-west side of Ras Ali Bash Kil. The shore in its southern part is low, sandy, and covered with bushes, but on the western side is a range of limestone table mountains 2,700 feet in height, their summits only 4 miles distant from it, and descending to the plain in steep precipices intersected by fertile valleys. North-westward of this range is the still higher range, Jebel Guraleh, already described.

In Ghubbet Binna about 12 miles north-westward of Ras Ali Bash Kil are 2 villages with forts; together they form Bargal, the residence of the chief of the Mijertein tribe. At the northern village is a small bay where landing may be effected in fine weather.

The depths in the bay are regular, increasing gradually from the shore to 20 fathoms at from 2 to 5 miles distance from it, the general nature of the bottom being sand and shells offshore and rock close in.

Anchorage.—At the southern end of the bay is Khor Binna, a salt water lagoon, with Gondoli village on the beach at its western end, about 5 miles from the Ras. The anchorage off Gondoli, in not less than 7 fathoms, is good and sheltered from southerly winds; it is not often subject to heavy gusts from the high land, but squalls from the south-westward are not uncommon.

RAS ALI BASH KIL (*Lat. 11° 9′ N., Long. 51° 9′ E.*) is a prominent bluff headland rising as a steep cliff 400 feet above the sea, with a depth of 20 fathoms off.

Between Ras Ali Bash Kil and Ras Hafun, 44 miles farther southward, the shore is low, sandy, thickly covered with bushes, and bounded 3 or 4 miles in the interior by the range of flat table hills about 700 feet in height, of which Ras Ali Bash Kil is the north-eastern termination.

The soundings in the bay are regular and shoal gradually towards the shore; the 10-fathoms contour line, which is only 2 or 3 cables from the shore off Ras Ali Bash Kil, gradually increases its distance until it is 4 miles from the shore in Hafun North bay. The edge of the bank or 100-fathoms contour-line

Chart 100a, Ras Galweni to Ras Hafun. Var. 0° 20′ W.

is from 10 to 12 miles distant from the shore. The general nature of the bottom is grey sand and shells.

Water.—There appears to be a plentiful supply of water in this bay. About 10 miles southward of Ras Ali Bash Kil is Wadi Jambokh, a valley through the flat table land described, where inhabitants are numerous and fresh water abundant. At Dehgubo, 12 miles southward of Wadi Jambokh, is a well of good water; and 7 or 8 miles farther south is Handa lagoon, salt, except at the head, where it is fresh but barely drinkable; there is, however, a well of good water a few yards higher up.

RAS HAFUN (or "The Surrounded"), (*Lat. 10° 26′ N., Long. 51° 23′ E.*), is a peninsula and prominent headland, 8 miles wide north and south, and 12 miles long east and west, from 400 to 600 feet in height, rising in steep cliffs from the sea, and formed of sandstone and limestone. The eastern extreme of the peninsula is flat, and the interior consists of undulating hills, deeply intersected by ravines and water-courses. The south-western point of the promontory of Hafun is high and flat, resembling a barn, whence it is called Barn hill; at a distance it appears separated from the rest of the peninsula, the land between being low.

Ras Hafun is connected with the mainland by a long narrow isthmus of white sand, shells and mud, with a few stunted bushes thinly scattered along it, and from its being almost an island probably takes its name of Hafun. On either side of the isthmus is a deep bay, with good sheltered anchorage (below described) in one or other of them according to the season.

The peninsula is in the Mijertein territory and is occupied by the Aial Fatha branch of the Othman family; there are only a few miserable huts with from 50 to 70 inhabitants, friendly to strangers. The water in the wells is bad. Cattle and firewood are procurable.

Hafun North bay is clear of danger, and affords anchorage during the South-west monsoon in from 7 to 10 fathoms, hard sand, but the holding ground though good in some places is bad in others. Near the north-western extreme of the peninsula the shore must not be approached by large vessels within 3 miles, as depths of from 3 to 4 fathoms extend nearly that distance from it.

The depths elsewhere in the bay are regular and increase gradually from 4 to 6 fathoms close in, to 38 and 40 fathoms 11 miles offshore; the bottom is hard white sand. There is shelter in this bay from southerly winds, but it is doubtful whether a vessel could ride in safety in the full strength of the

General charts 100a, 6a, 597, and 1012.

Chart 100a, Ras Galweni to Ras Hafun. Var. 0° 20′ W.

South-west monsoon, owing to the heavy swell that must roll in round the point, and the violent gusts of wind blowing across the headland. These gusts render it necessary for a sailing vessel to be ready to shorten sail when standing close along the land past the cape or when coming to an anchor under it.

In May 1871, during a moderate gale from the southward, H.M.S. *Forte* was anchored in 7¼ fathoms, with the north-west point bearing West, and dragged with 70 fathoms of cable out. H.M.S. *Nimble*, at anchor 3 cables S.S.E. from the *Forte*, also drifted with 60 fathoms of cable out. On the other hand, in July 1903, H.M.S. *Merlin* was at anchor here for several hours, the wind blowing with a force of 8 to 10, and found the holding ground to be good.

Large quantities of fish may be caught by hook and line in this bay.

Khor Hurdia (*entrance Lat. 10° 33′ N., Long. 51° 10′ E.*), on the northern side of the isthmus of Hafun, is a harbour 2½ miles wide at its entrance, and 12 miles long to its head. As an anchorage it is available for boats only, the depth inside being only from one to 1½ fathoms. This locality is probably the most unhealthy spot on the Somáli coast; its shores and the bottom being covered with decomposed vegetable matter, which, on being disturbed, gives forth a noxious and sickening odour, yet there are many fishermen living on the sea-shore. There is no fresh water here, but the natives state that at Khor Hashera, at the head of the bay, a stream of fresh water runs into it.

Trade.—The village of Hurdia stands on the seaward side of the northern point of entrance to the khor. Here, during the South-west monsoon, a kind of fair is held annually. Merchants from Makalla, Shehr, and from the several small places to the northward of Ras Asir, attend this meeting at the end of May, when their dhows are hauled up on the beach; and throughout the South-west monsoon a brisk trade is carried on in gums, ostrich feathers, hides, ivory, and ghi; quantities of ambergris are also brought for sale.

Hafun South bay is best adapted for vessels during the North-east monsoon, but a change of two or three points in the direction of the wind causes a swell to roll in and a heavy surf on the beach. The bay is much frequented by shark fishers from the Arabian coast, many of whom reside here throughout the year, merely moving their fishing boats to the other side of the isthmus as the monsoon changes.

The depths in the southern bay are regular, decreasing gradually towards the shore, with the exception of a 3-fathoms patch of sand inside the 51-fathoms line at about 7 cables off the

Chart 100a, Ras Galweni to Ras Hafun. Var. 0° 20′ W.

northern shore, with the west extreme of the table land bearing N.N.W. ½ W. The best anchorage is in 6 or 7 fathoms, sand, at from one to 1¼ miles from the shore, with the south-western point of the peninsula bearing about S.E. The nature of the bottom is sand and rock.

Tides.—It is high water, full and change, at Ras Hafun at 6h. 15m.; springs rise 4 feet.

For the continuation of the African coast to the southward, *see* African Pilot, Part III. The coast southward from Ras Asir is repeated in that volume.

ISLANDS EASTWARD OF RAS ASIR.

Chart 6a, Gulf of Aden, sheet 1. Var. 0° 10′ W.

ABD-AL-KURI is a narrow island midway between Ras Asir and the western end of Sokótra, and is 20 miles in length east and west, by nearly 3½ miles in width. It consists of two ranges of hills which occupy the whole length of the island, but being separated near the centre, they give it the appearance of two islands when seen from a distance. The eastern range is elevated, 1670 feet at its western extreme, while the western range is but 790 feet. The northern shore is chiefly a sandy beach, with a few rocky points; the southern side consists of cliffs rising abruptly from the sea. The bank of sounding extends from one to 3 miles northward, and 4 miles southward of the island.

The inhabitants are few and miserably poor, subsisting chiefly on shell-fish; they have no boats, and the island is seldom visited by strangers. It is destitute of cultivation, and the water is indifferent.

Ras Khaisat-en-naum (*Lat. 12° 13′ N., Long. 52° 4′ E.*), the western extreme of this island, consists of two sharp rocky points, half a mile distant from each other. From the northern point, a reef of rocks extends one mile westward with 5 fathoms close to and from 25 to 35 fathoms half a mile distant.

During the survey of this locality by H.M.S. *Fawn* in May 1877, the current was observed setting N.N.E. at from half a knot to 1½ knots an hour and numerous tide rips were seen in the vicinity of the shoal water.

Caution.—Off the western end of Abd-al-Kuri, owing to the higher hills being some distance inland, it is difficult to estimate correctly the distance from it. This fact should be borne in mind, especially at night, when, to ensure passing the western end of this island at a prudent distance of not less than 2 miles, the water should be shoaled at not less than 40 fathoms.

General charts 6a, 597, and 1012.

Chart 6a, Gulf of Aden, sheet 1. Var. nil.

Bank.—About 9 miles W.N.W. of Ras Khaisat-en-naum is a coral bank with from 24 to 30 fathoms water, and from 60 to 180 fathoms all round. In mid-channel, between the island and Ras Asir, soundings of from 400 to 600 fathoms have been obtained.

The southern coast of the island from Ras Khaisat-en-naum trends eastward 10 miles to Bander Saleh, rising in cliffs abruptly from the sea, and forming several points, one of which Ras Hattan, is a bluff 2¾ miles distant from the western end. About 3½ miles eastward of Ras Hattan is a rocky islet close to the shore, between which and the shore is a small bay with sunken rocks. On this part of the coast the water is deep, there being from 18 to 20 fathoms close to the cliffs, increasing to 100 fathoms at 4 miles off.

Bander Saleh, or Leven bay, is on the southern side of the island, immediately westward of the extreme of the highest mountains. It affords good anhcorage during the North-east monsoon in from 6 to 10 fathoms, coral bottom, from 2½ to 5 cables from the shore. This is the narrowest part of the island, it being only one mile across, and consisting of moderately high sandhills. There are a few huts and a well of indifferent water a short distance from the beach, but no supplies are to be procured.

From Ras Labaineh, the south-eastern point of the bay, to the south-eastern extreme of the island, the coast consists of steep cliffs, with from 10 to 12 fathoms water close to.

The south-eastern point is low and rocky, the mountain range sloping off to it. Off the point are three small rocks, and between this point and Ras Anjara is a bay about 1½ miles wide with a sandy beach, and a rocky islet 3 cables from the cape; it has depths of from 6 to 10 fathoms nearly a mile from the shore.

Ras Anjara (*Lat. 12° 11′ N., Long. 52° 24′ E.*), the north-eastern point of the island, is a rocky point with a sandhill.

Bacchus bank.— About 1½ miles north-eastward of Ras Anjara is Bacchus bank, with a least depth of 4 fathoms and 7 to 9 fathoms around it; wind against tide causes a strong ripple on this bank.

Between the eastern end of Abd-al-Kuri and the western end of Samha, the westernmost of the Brothers islands, the channel is 35 miles wide and there is no danger in it except Bacchus bank just mentioned.

General chart 597.

Chart 6a, Gulf of Aden, sheet 1. Var. nil.

The northern coast of the island from Ras Anjara westward to Ras Teram, a distance of 7 miles, is low and sandy, and forms Bander Lon, a bight in which are a few huts and a well of indifferent water; the shore near the well is fronted by some sunken rocks close in. From Ras Teram to Ras Haimera, a small rocky point 6 miles farther westward, the shore consists of small rocky points with sandy beaches intervening; about 2 miles eastward of the latter point is a sunken rock close to the shore. From Ras Haimera the coast trends irregularly for 7 miles to the western extreme of the island.

The anchorage along the northern shore is said to be indifferent, but in the month of August H.M.S. *Briton* anchored in 9 fathoms, sand, with Ras Haimera bearing S.E. and 790-feet peak S.W. $\frac{3}{4}$ W., good holding-ground.

KAAL FIRAON (Farun rocks), (*Lat. 12° 26′ N., Long. 52° 9′ E.*), about three-quarters of a mile in length and from one to $1\frac{1}{2}$ cables in width, are two rocky islets steep-to and divided from each other by a narrow channel with many sunken rocks; they lie N.N.E. distant 13 miles from the western end of Abd-al-Kuri, and are on the northern side of a large bank 10 miles in length. The eastern and larger rock has one peak 282 feet high and two smaller ones. The western rock has also one peak of about the same height and one smaller one. Thus from different points of view they show several peaks and are completely covered with guano, which gives them a snow-white appearance; their only occupants are birds, which flock here in great numbers.

These rocks are visible in clear weather about 20 miles; but at night they are difficult to distinguish owing to their colour.

Tides and Tidal streams.—At Kaal Firaon it is high water, full and change, at 8h. 20m.; springs rise 6 feet. Through all the channels between the islands westward of Sokótra, the flood sets northward and the ebb southward, but the streams are much influenced by the current of the prevailing monsoon; when not so influenced, it is said that they run from one to 2 miles an hour.

THE BROTHERS are two islands lying eastward of Abd-al-Kuri and south-westward of Sokótra, and on the same plateau of soundings as the latter. They are named Jezírat Samha and Jezírat Darsa.

Depths of from 15 to 20 fathoms extend eastward of these islands for about 35 miles, and probably farther, but neither this part nor that southward of the Brothers has been

Chart 6a, Gulf of Aden, sheet 1. Var. nil.

thoroughly examined. In the channel, 9 miles wide, between the Brothers, there is no danger, the depths varying between 20 and 25 fathoms, sand and shells, with occasional patches of coral.

Jezírat Samha (*Lat. 12° 9′ N., Long. 53° 5′ E.*), the westernmost of the Brothers, is 6½ miles in length by 3 miles in breadth near its eastern end, but narrowing to a point at its western end. It consists of a small hill near its western extreme, and of a table mountain for nearly half its length, the highest part of which, near the centre and towards the southern shore, is 2,440 feet above the sea; its northern extreme terminates in a well-defined bluff. The shores are rocky, and the southern side rises in perpendicular cliffs from the sea.

A reef extends half a mile off the western point, and another half a mile from the north-eastern point, and there are two rocky islets off the south-eastern side. About 1½ miles E. by N. from the north-eastern point is a small bank of 13-fathoms. On the southern side, the 20-fathoms line is about 5 miles distant.

Occasionally, during the fine season, people from Sokótra visit Samha for the purpose of fishing, catching turtle, and collecting ambergris. Water runs from the mountain in small quantities all the year round.

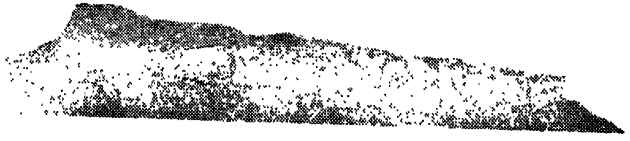
Jezírat Darsa (*Lat. 12° 7′ N., Long. 53° 18′ E.*), the eastern island of the Brothers, lies 9 miles eastward of Samha and is 3½ miles in length by one mile in width, and 1,500 feet high, with an even table top the whole length of the island rising perpendicularly from the sea, except on the northern side, where the northern point of the island projects about 3½ cables from the base of the hill.

The eastern extreme of the island lies nearly due South 26 miles from Ras Shoab, the western point of Sokótra.

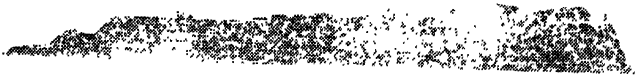
Chart 5, Sokótra island. Var. 0° 10′ E.

SOKÓTRA ISLAND (*Tarida, Lat. 12° 39′ N., Long. 54° 0′ E.*), distant about 130 miles from Ras Asir, 190 miles from the Arabian coast, and 500 miles from Aden, was formerly under the nominal government of the Sultan of Kishin, on the Arabian coast; it was placed under British protection by treaty with that Sultan on 23rd April 1886, and on 30th October of that year the British flag was hoisted at Tamrida, the capital, situated on the northern shore of the island. The Sultan of Sókotra has a residence on the Gharriah plain, at the base of Jebel Haggier, and another in Tamrida.

Situated on the highway of traffic to the East, this island is almost invariably sighted by steam-vessels bound to or from the



Samha Island, *E. by N. ½ N., distant 20 miles.*



Darsa Island East, *distant 20 miles.*

Chart 5, Sokótra island. Var. 0° 10′ E.

Gulf of Aden, but being exposed to both monsoons, and having no harbours in which vessels can at all times ride safely at anchor, coupled with the unfavourable character the natives have hitherto borne, Sokótra is but little visited.

The island rises to its summit of 4,656 feet in Jebel Haggier, 4 miles southward of Tamrida. It is 70 miles in length in an east and west direction, by about 18 miles in width, and has a coast-line of about 180 miles.

On the southern side, the shore preserves nearly an unbroken line, but on the northern and western sides it is broken into a succession of small bays, generally with streams at their head, affording anchorage according to the season; but not one of them is safe at all times of the year. Over a wide area, the hills rise with considerable abruptness in bold perpendicular cliffs several hundred feet in height, but at other places there are plains, varying in breadth to as much as 5 miles between the base of the hills and the shore. On the southern side is the Naukad plains, the largest of these, which, extending nearly the whole length of the island, is for miles covered with dunes of drift sand. The southern side, though considerably less fertile than the northern, is, towards Ras Momi, near the eastern end, tolerably productive; but, westward, it is as arid and barren as the worst parts of Arabia.

On the northern side, these plains occur chiefly at the mouth of streams, and are the sites of the only places which may be called towns. The internal part of the island may be roughly described as wide, undulating, and intersected by limestone plateaux of an average height of 1,000 feet, which flank on the west, south, and east, a nucleus of granite peaks over 4,000 feet in height. These are seldom free from cloud, but when the weather is clear their appearance is broken and picturesque.

The whole of this hilly region is deeply intersected by ravines and valleys which, in the rainy season, are occupied by roaring torrents, but the majority are empty in the dry season; there are, however, many perennial streams, especially in the central regions, though but few reach the shore in the dry season. The eastern end of the island is the most destitute of water. As a general remark, it may be observed that in the North-east monsoon nothing presents a stronger contrast than the eastern and western ends of the island; while the former is destitute of verdure, has scanty pasturage, and, with the exception of some places near the sea, has no water other than that which is retained in natural reservoirs, the latter is supplied with frequent streams, its valleys and plains afford luxuriant grass, herds of cattle are numerous, and the scenery in many places is very picturesque.

General charts 6a and 597.

Chart 5, Sokótra island. Var. 0° 10′ E.

In the plain about Tamrida, and some parts near Kadhup, are several beautiful valleys, with a soil well adapted for the cultivation of grain, fruit, and vegetables. In the valleys through which the streams flow, not only are there extensive groves of date trees, but a wide border of rich turf, with occasional enclosures of jowari (millet); and here and there a plantation of indigo or cotton indicates no want of fertility in the soil.

Climate.—Though Sokótra is but a short distance from the African continent and also from Arabia, yet, from both monsoons blowing over a vast expanse of water, it enjoys a remarkably temperate and cool climate as compared with either of them. The climate on the hills is very healthy, but on the plains, especially at the change of the monsoons, fever is prevalent. The mean daily temperature on the plain in the North-east monsoon is about 70°, but in the South-west monsoon it is as much as 86°; on the plateau, the temperature at night often falls to about 50°.

The island has two wet seasons—June to August, and November to January. In July, August, and September, rain falls in showers, but not equal in quantity to that which falls during the squalls of November, December, and January.

Products.—Gum and resin-producing plants are numerous; the most important is the aloe sperryi, the Sokótrine aloes of commerce (called in the island, tayef; and by the Arabs, súba). The island has been famous for the first-named plant from the earliest times; it grows spontaneously on the sides and summits of the limestone mountains, at from 500 to 3,000 feet above the level of the plains.

The next in importance to the aloe is the dragon's-blood tree. Like the aloe, it is usually met with on the hills, rarely at less than 800 feet and frequently as much as 2,000 feet above the sea.

The wood of a tree named metayne, a kind of box tree or large shrub which abounds in every part of the island, is so hard as to answer the same purposes as those to which lignum vitæ is applied, such as the manufacture of sheaves or blocks.

It is to their date groves, next to their flocks, that the inhabitants look for means of support; but, notwithstanding the large quantities collected, the supply is not sufficient, and a large import takes place annually from Maskat. Melons, beans, small onions, and a little tobacco are grown. But little cereal culture is attempted; here and there a small enclosure of jowari may be seen, but the inhabitants are too indolent to cultivate it to any extent, the watering requiring much labour.

General charts 6a and 597.

Chart 5, Sokótra island. Var. 0° 10′ E.

Vast numbers of cattle, sheep, goats, and asses and a few camels are found on the island. The only wild animal is the civet cat. On the low lands, scorpions, centipedes, and a large and venomous description of spider, called nargub by the Arabs, are common.

Trade.—The trade of the island is small, ghi and aloes being the chief articles of export. It is carried on by bagalas from the Arabian coast, These arrive in the first month of the year with coffee, rice, and other articles, which they exchange for ghi, aloes, orchilla weed, &c., which they take to Zanzibar, bringing back cocoanuts, bombé, and piece-goods. They dispose of as much of these as possible, returning to Arabia with aloes, dragon's-blood, blankets, &c. Rupees are taken in payment for goods supplied, but barter in kind is usually preferred.

The Sultan takes tithes of all exports, amounting to about $1,000 a year, which, with his stipend of $360 from the British Government, makes him a comparatively rich man.

The inhabitants may be divided into two different classes—the Bedouins, many of whom are tall and well made, who inhabit the mountains and the high land near the western extreme of the island, and who, there is every reason to believe, are the aborigines; and those who reside in Tamrida, Kadhup, Kallansiya, and the eastern end of the island—a mixed population, the descendants of Arabs, Indians, Africans, Portuguese, and several other nations. The whole population is roughly estimated at about 12,000, but so many people dwell in caves in the hills that it is impossible to arrive at anything but an approximation.

Though Arabic is spoken by merchants when transacting business with traders visiting the island, there is a language peculiar to it in general use among its inhabitants; it is no longer a written language, though it appears formerly to have been so.

Anchorages.—With the exception of a few headlands, off which are projecting reefs, the shores of the island are bold, with moderate depths for some distance offshore in places as charted. There are several anchorages which afford protection according to the prevailing monsoon, but none affording shelter at all times.

The southern side, having but few inhabitants and very little water, is seldom visited, but the anchorage is good. Ghubbets Kallansiya and Shoab at the western end, Ghubbet Neh on the south-western side, and Bander Arasal at the south-eastern end, all afford good anchorage in the North-east monsoon.

General charts 6a and 597.

Chart 5, Sokótra island. Var. 0° 10′ E.

The northern side of the island is also considered safe in that monsoon from about February, which is near the end of it. In the South-west monsoon, there is fair anchorage in all the bays on the northern side eastward of Ras Kadarma; Bander Delaisha is by far the best in the strength of that monsoon. Tamrida is said to be more exposed to the violent gusts from the hills and to the swell, but it affords good shelter with the wind well off the land, and there is little danger with good ground tackle. These anchorages are usually on a narrow bank of sand or rocky bottom, sloping rapidly to deep water. These remarks more particularly apply to sailing craft.

WINDS.—From November to January, the prevailing wind is N.N.E and is the most dangerous wind on the northern side of the island, blowing in violent gusts for several days at a time.

From February to May is the fine weather season when the anchorages on the northern coast are considered safe.

In June, July, and August, the months when the South-west monsoon is at its height, the natives say it blows incessantly in hard and violent gusts on the northern coast; but on the low land of the southern coast the wind is more steady and less violent, with, however, a tremendous sea and surf.

In September, October, and part of November, light land and sea breezes are experienced, towards the latter part becoming more steady from the northward.

Tides, Currents.—The time of high water at full and change varies from 7h. 20m. to 8h. 40m. in different parts; rise from 6 to 8 feet. The tidal streams are very irregular, sometimes running in one direction for 16 hours, at other times only 6 hours, depending in great measure on the strength and direction of the wind. The flood sets westward on the southern side of the island and eastward on its northern side; the ebb in the opposite directions. Close round the island the currents are influenced by the tides and winds, generally setting with the wind after blowing hard for any length of time. For the offing currents, *see* page 26.

WEST COAST.—Ras Shoab (*Lat. 12° 34′ N., Long. 53° 20′ E.*), the western extreme of Sokótra, is a bold cape, being the termination of Jebel Shoab, which rises to a height of 1,488 feet 2½ miles eastward of the cape. A reef extends about 1½ cables from the cape, and the depths increase gradually from 14 fathoms at half a mile off the cape to the 100-fathoms contour-line about 4½ miles offshore. *See* sketch facing page 479.

General charts 6a and 597.

Chart 5, Sokótra island. Var. 0° 10′ E.

Ghubbet Shoab, on the northern side of Ras Shoab and between it and Ras Baduwa, is a bay about 7 miles wide and receding 3 miles. It is completely exposed during the South-west monsoon, but affords good shelter with smooth water during the North-east monsoon, though at times strong gusts are experienced. The depths in the bay vary from 19 or 20 fathoms between the two points to 6 fathoms at 7 or 8 cables from the head of the bay; there are no known dangers, and the nature of the bottom is generally sand or rock.

Formerly, there was in this neighbourhood a population of about 150 persons who lived in caverns and in natural excavations, and also in the village of Marthain Gibus, where good water may be obtained from wells; in March 1876, when visited by H.M.S. *Briton*, no natives were seen.

Anchorage.—The best anchorage with smooth water during north-easterly winds is 7 or 8 cables from the shore in 10 fathoms, clear, white sandy bottom, with Ras Baduwa bearing N. by E., Ras Shoab S.W. by W. ¾ W., and the Ass's Ears of Jebel Shoab S.W. by S. This anchorage is off some mangrove trees, close southward of which is a salt water lagoon which rises and falls with the tide, although it has no perceptible communication with the sea, being separated from it by a bank of sand nearly 2 cables in breadth; it extends inland, with mangrove trees on its banks, for nearly one mile.

Jezírat Sabuniya (*Lat. 12° 39′ N., Long. 53° 12′ E.*), immediately off Ghubbet Shoab, is a granite islet 4 cables long by three-quarters of a cable wide, 215 feet high, and culminating in three peaks; it may be seen about 18 miles distant, when, being white, it resembles two vessels under sail. From it, Ras Shoab bears S.E. ½ E. 9 miles, with a mid-channel depth of over 100 fathoms. (*Chart 6a.*)

SOUTH COAST.—Ghubbet Neh.—From Ras Shoab, the coast trends south-eastward nearly in a straight line for 10 miles to a sandhill, where is a little bay known as Ghubbet Neh, in which is a small village, and off which there is anchorage in the North-east monsoon.

From this sandy bay to Ras Kattánahan, 7½ miles farther south-eastward, the shore is rocky and precipitous, with several small points and bays, and has throughout from 3 to 6 fathoms water a few yards from it; the bottom along this part of the coast is in general sand and rock, with no hidden danger, but a bank of from 6 to 7 fathoms, about half a mile wide and one mile from the shore, lies parallel with the shore for nearly the whole distance, with 8 or 9 fathoms water both inside and outside it.

General charts 6a and 597.

Chart 5, Sokótra island. Var. 0° 10′ E.

Ras Kattánahan (*Lat. 12° 22′ N., Long. 53° 33′ E.*) is a level, bold, perpendicular cape, 1,465 feet in height. It is the western extreme of the mountain chain, which, with several breaks, extends along the whole southern coast of Sokótra, generally at a short distance inland. The point has the same aspect, whether viewed from east or west.

Tides.—Along the southern coast of Sokótra, the ebb stream sets eastward, averaging about one mile an hour, but depending greatly on the wind. It is high water, full and change, at about 7h., but the time also is very irregular; springs rise 7 feet.

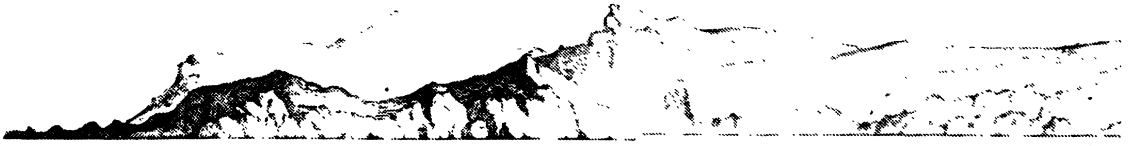
Jebel Kuireh, a mountain chain of nearly the same height as Ras Kattánahan, extends 5 miles from it in an easterly direction. From Jebel Kuireh, the same chain, but with different names, continues, as has been already stated, nearly to the eastern end of the island, the different parts being merely separated by a few mountain passes by which the inhabitants travel on foot across the island to Tamrida, the capital.

The Naukad.—The mountains rise generally like a wall from the Naukad, the plain lying between them and the sea, and which is from 2 to 4 miles wide. The Naukad plain affords pasture for sheep and goats, of which there are great numbers. The natives of the plain are few and much scattered.

Water.—The best water comes from the mountains, falling into natural reservoirs. There are wells on the plain, but the water is brackish and only used for the flocks. Near the villages of Hakari and Deairi, the water is somewhat better. The best reservoir is about 9 miles westward of Ras Fálanj and close to the sea, being only separated from it by a bank of shingle where the low sandy beach terminates in rocky cliffs. This reservoir is supplied by a fine stream running through the Wadi Fálanj, between Jebel Fálanj and Jebel Sharbi. A vessel in want of water during the North-east monsoon might procure it with ease by anchoring tolerably close in-shore in 7 fathoms, and at the same time might obtain sheep; caution should, however, be observed in dealing with the natives.

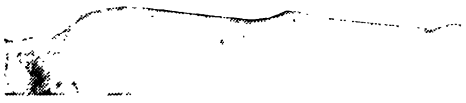
Anchorage.—The southern coast of Sokótra is everywhere bold to approach, the soundings decreasing gradually towards the shore. There is no danger, although in some places there are overfalls. The edge of the bank, within 100 fathoms, between Hákari and Ras Fálanj appears to be from 10 to 12 miles offshore. A vessel may anchor anywhere along this coast in from 9 to 12 fathoms, sand and coral, about one mile offshore.

General charts 6a and 597.



Ras Radressa.

Ras Radressa. *S.W. by W., distant 9 miles.*



Ghubbet Shoab.

Ras Shoab.
Ras Shoab East.

Chart 5, Sokótra island. Var. 0° 20′ E.

Ras Fálanj (*Lat. 12° 31′ N., Long. 54° 26′ E.*) is situated about 6 miles south-westward of Ras Radressa, the eastern extreme of Sokótra; when seen from the westward it appears as a bluff cape, but, on a near approach, a low point is seen to project from it rather more than a mile, from which a reef of rocks, some above water and steep-to, extends south-eastward about 2 cables; on each side of the point a bay is formed.

The summit of the bluff 2 miles westward of Ras Fálanj is 1,505 feet above the sea, and from it the high land continues in a north-easterly direction, attaining a height at Ras Momi, of 1,920 feet, from whence the land falls to a moderately high mountain of granite, then to several small hillocks of the same formation, finally terminating in the low rocky point Ras Radressa.

Bander Arasal is the bay between Ras Fálanj and Ras Radressa.

RAS RADRESSA (*Lat. 12° 35′ N., Long. 54° 30′ E.*).—This, the comparatively low eastern extreme of Sokótra, consists of two small rocky points on a north-north-westerly line of bearing and nearly one mile apart. Off each point a reef extends about 3 cables, over which there are strong tide rips, and at 1¾ miles both eastward and northward of them no bottom has been found at 110 fathoms; consequently, in approaching this end of the island from either of these directions, the lead affords no guide.

Southward and south-eastward of the point, the depths decrease gradually towards the shore to 26 fathoms at about 3 miles from the detached dry rocks off the point.

Caution.—The east point of Sokótra is dangerous to make during the South-west monsoon period, the lower land eastward of the mountain range, referred to below, being often obscured by haze, and the soundings giving no indications of approach to it. As, when coming from the direction of Minikoi, passing 40 miles northward of Sokótra only adds 8 miles to the length of the voyage, no vessel should attempt to pass nearer.

Rocks.—A rocky bank, about three-quarters of a mile in extent, with some parts dry, and from 5 to 6 fathoms between the heads, lies about one mile south-eastward of Ras Radressa. A high sea generally breaks over the bank. Between these rocks and the reef extending from the point there are depths of 4 to 9 fathoms.

Anchorage.—There is temporary anchorage in smooth water during the North-east monsoon, in about 9 fathoms, with

Chart 5, Sokótra island. Var. 0° 20′ E.

the outer head of the rocks bearing E. by S. and Ras Radressa about N.E. ½ E.

Ras Momi, or Ras Mutláh, is the extreme eastern sharp high bluff, or termination of the range of mountains extending the whole length of the island, and is 1,920 feet high, being visible in clear weather at a considerable distance, when the lower land, from 180 to 200 feet in height nearer the extreme of Ras Radressa and 4 miles farther eastward, is not visible. The width of the island from the northern to the southern shore at Ras Momi is but a little over a mile.

NORTHERN COAST.—Bander Faka, or Thleife, is a small bay on the north-eastern side of the island, formed between a sandy point 1½ miles westward of Ras Radressa, from which a reef extends about half a mile, and Ras Deidum. In the centre of the bay are two double sandhills with a few trees and a spring of fresh water between them. The shore is low and sandy, backed half a mile inland by moderately high mountains.

The eastern part of this bay affords temporary anchorage protected from easterly winds by the reef; here small craft from India on their pilgrimage to Jidda, stop occasionally to procure water in the months of April and May, at which time the winds are westerly.

Anchorage.—The best anchorage is in from 9 to 12 fathoms water about half a mile offshore, with the outer breaker of the reef off the eastern point of the bay bearing N.E., and the point eastward of Ras Deidum W. by N. ½ N. Caution is requisite in rounding the point of the reef, for unless it is blowing fresh the outer breaker, which has 5 fathoms close-to, is not always visible. In the western part of the bay the depths are regular, decreasing gradually towards the shore.

Supplies.—Sheep, milk, and butter are procurable. Water is to be obtained from a well near the village, or from the spring which rises between the two eastern sandhills. The well is probably the best watering place, there being much surf on the beach near the sandhills if the wind is at all from the northward.

Ras Deidum is a rocky point about 250 feet high and 9 miles westward of Ras Radressa; it appears to be the eastern boundary of the fertile part of the island, for eastward of it a shrub is scarcely to be met with, except for the few trees at the sandhills before alluded to. Westward of Ras Deidum, both hill and valley are covered with luxuriant vegetation.

General charts 6a and 597.

Chart 5, Sokótra island. Var. 0° 20′ E.

Ras Hammadara (*Lat. 12° 39′ N., Long. 54° 14° E.*) is a low rocky point 8 miles westward from Ras Deidum. North-eastward of the point, and half a mile distant, is a patch of rocks nearly dry, between which and the reef fringing the shore is a channel about 1½ cables wide, with from 3 to 5 fathoms; the patch is fairly steep-to.

Between Ras Deidum and Ras Hammadara the coast is low, with an occasional rocky point, and sand and shingle in the intervening bays; here are some date groves named Thuereh, Kleef, and Tumereh, with a fresh-water pool near Kleef. The high land is about 2 miles westward and ranges from 1,000 to 1,200 feet in height. There are no known dangers on this part of the coast, but it is not advisable to approach it in the North-east monsoon.

Between Ras Hammadara and Ras Dehammeri the coast is also low, with occasional rocky points and sandy bays between, and is generally fronted by a narrow rocky ledge. The 20-fathoms contour-line is here about half a mile offshore, from whence the bank rapidly falls to no bottom at 180 fathoms at from one to 2 miles from the beach.

Khor Garrieh is a creek, nearly dry at low water, between Ras Hammadara and Ras Dehammeri. Its source is several miles in the interior, and it has date trees growing on its banks.

Bander Garrieh is the bay formed by the projecting point of Ras Dehammeri; here a vessel might anchor with the extreme point of the cape bearing from N.W. by N. to N.N.W. in from 6 to 10 fathoms, from 2½ to 5 cables off-shore, and perfectly sheltered from the South-west monsoon.

Ras Dehammeri (*Lat. 12° 41′ N.. Long. 54° 10′ E.*) is a low narrow peninsula from 500 to 700 yards across, having on it two remarkable hillocks by which it may always be known, the northern one being about 130 feet high. A sunken rock, steep-to, lies close off the extreme point, and a rocky spit of 2½ fathoms projects from the rocky point south-westward of it. There is no bottom at 270 fathoms at one mile northward of the point.

Bander Debeni is the anchorage on the western side of Ras Dehammeri, protected from easterly winds. A small vessel may anchor in from 3 to 3½ fathoms, south-westward of the rocky spit off the inner point, with Ras Dehammeri bearing E.N.E. There is no danger in the bay except the spit, but the anchorage does not seem adapted for large vessels; the bottom is coral or rock.

General charts 6a and 597.

Chart 5, Sokótra island. Var. 0° 20′ E.

Bander Delaisha is merely a continuation of Bander Debeni, and is bounded westward by a point on which is a small ruined mosque or tomb about 1¾ miles eastward of Ras Haulaf. In the centre of the bay is a sandhill, and half a mile westward of it is Khor Delaisha, apparently closed in the dry season, but joined inland to a fine fresh water stream with date trees on its banks.

The bay has good anchorage depths everywhere close inshore, the 10-fathoms contour-line being from a half to three-quarters of a mile from the beach. It affords the best shelter of any of the anchorages during the South-west monsoon. A good berth is with the sandhill bearing South in from 7 to 9 fathoms, at from 3 to 5 cables offshore.

Plan, Tamrida, or Hadibo bay, on chart 5.

Ras Haulaf (*Lat. 12° 42′ N., Long. 54° 4′ E.*), the eastern point of Tamrida bay, is a low, rounded, projecting point, rising gradually towards the interior; it consists chiefly of undulating sandhills covered with prickly bush; on its sea face are small rocky points with intervening sandy beaches. One mile north-eastward of the cape there is no bottom at 190 fathoms, but northward and north-westward of it the bank does not appear to end so abruptly.

TAMRIDA or HADIBO (*Lat. 12° 39′ N., Long. 54° 0′ E.*), called also Bilad-al-Sultan by the Arabs, is the capital of Sokótra. It consists of a number of white plastered stone houses, similar to those usually to be seen in Arabia, surrounding a larger one, which is the residence of the Sultan. A date grove surrounds the town or village, which is said to contain a population of about 400 only, though there is no late information on this point. It is prettily situated at the head of the open bay of Tamrida, of which Ras Haulaf to the north-eastward and Ras Hebak to the westward, 7 miles apart, are the boundaries.

As already stated, the British flag was hoisted at Tamrida under a salute of 21 guns on the 30th October 1886.

The villages of Suk, Deshelenata, and Hernout lie eastward of Tamrida, between it and Jebel Omhari, a sloping sandhill. Three streams discharge into the bay from the hills as charted.

The position of Tamrida may be known from the offing by the high craggy granite peaks of the mountain range overhanging the plain on which it stands; of which range, Jebel Haggier, the loftiest part, rises to a height of 4,656 feet above the sea; or, if the peaks are clouded, by Jebel Omhari, a lower hill; which, when seen from a distance of 10 or 12 miles on a south-easterly bearing, appears like a white cliff sloping to the southward; and also by Ras Haulaf, the low eastern point of the bay.

General charts 6a and 597.

Plan, Tamrida, or Hadibo bay, on chart 5. Var. 0° 20′ E.

There is no danger in the bay; the depth increases gradually from the shore to 8 or 10 fathoms at one mile, and 20 fathoms at 3 miles, outside of which it apparently deepens rapidly. The nature of the bottom is sand and stones with patches of mud.

Landing.—The best landing-place is on the shingle beach close to the western extreme, near the town abreast of some date palms. During the North-east monsoon, when the breeze is fresh from seaward, a heavy surf rolls in on the beach, rendering landing both difficult and dangerous.

Anchorage.—During the South-west monsoon the anchorage in Tamrida bay is exposed to strong gusts of wind from the land, and a heavy swell rolls in when the wind is well to the westward, rendering good ground tackle necessary; the holding-ground is said to be fair. It appears to be a desirable anchorage for a few days for sailing vessels or small steam craft proceeding eastward, instead of returning to Aden when the South-west monsoon is unusually violent, particularly if the wind is well to the southward, when the water is comparatively smooth.

A good berth is in 9 fathoms, with Ras Haulaf bearing E.N.E., and the large square house in the town about S. ½ E. There is good shelter close under Ras Haulaf in from 5 to 6 fathoms from all winds eastward of north-east, with comparatively easy landing, whilst off the town the sea may be breaking.

The bay is particularly unsafe during the first half of the North-east monsoon, viz., from November to January, both months inclusive, when heavy northerly squalls are frequent. From February to May is considered the finest season.

Tides.—It is high water, full and change, at Tamrida at about 7h. 50m.; springs rise, approximately, 7½ feet.

Supplies.—Tamrida is the most convenient place in the island for a vessel in want of supplies, but at times they are scarce. Good water, bullocks, goats, sheep, fish, and firewood may generally be procured; fowls are scarce, and no vegetables are obtainable. Aloes, dragon's blood, grapes, water-melons, pumpkins, oranges, and plantains may be procured in the months of March and April.

Ras Hebak (*Lat. 12° 39′ N., Long. 53° 57′ E.*), the western extreme of Tamrida bay and the eastern extreme of Ghubbet Kadhup, is a bold perpendicular, rocky point, having 5 fathoms water within a quarter of a mile of it.

General charts 6a and 597.

Chart 5, Sokótra island. Var. 0° 10′ E.

Ghubbet Kadhup is the bay westward of Tamrida bay included between Ras Hebak and Ras Taab; on its shores are the villages of Kadhup, Mouri, and Kathub, each with about 50 inhabitants. There is a salt water creek leading to Mouri and a swamp eastward of it. A vessel might anchor here in the South-west monsoon.

Ras Taab, 11 miles westward of Ras Haulaf, is a low sandy point, with a reef extending about 1½ cables.

GHUBBET KARMA.—Ras Karma (*Lat. 12° 39′ N., Long. 53° 51′ E.*), a low sandy point about 1¾ miles westward of Ras Taab, is the eastern extreme of Ghubbet Karma. A reef projects from it about 1½ cables and, continuing eastward as far as Ras Taab, considerably increases the shelter afforded by the point. The 5-fathoms contour-line lies half a mile from the shore between these points.

Ras Kadarma the western extreme of Ghubbet Karma, lies 13½ miles westward of Ras Karma. It is a low point and the termination of a high bluff close within it.

The shore of Ghubbet Karma is low and sandy, but, about 6 miles inland, a chain of mountains surrounds it, with an opening near the centre, through which the natives travel across the island. Southward of Ras Kadarma is another pass leading to the valley of Kallansiya. Straggling huts are scattered along the shores of the bay; the inhabitants possess numbers of sheep and bullocks. About 6 miles westward of Ras Karma and just inside the beach is Khor Hadjun, a deep salt water swamp with its entrance filled up; it extends about three quarters of a mile inland and is bounded by moderately high cliffs.

Anchorage.—The best anchorage is 6 or 7 cables from the shore in 5 or 6 fathoms, with Ras Karma bearing N.E. by E. ½ E. distant 1½ miles. In the South-west monsoon, it is as open as Tamrida bay to the heavy swell which is so severely felt when the wind is well to the westward. During the North-east monsoon there is considerable swell towards the western part of the bay.

The depths in the bay are regular, the 10-fathoms contour-line at the above anchorage being nearly 1¼ miles from the shore, the depths increasing to 28 fathoms at 4 miles. Off Ras Kadarma the bank of soundings extends but a short distance, there being 816 fathoms within 2 miles northward of it. The nature of the bottom is sand and coral inshore, sand and shells in the offing.

General charts 6a and 597.

Chart 5, Sokótra island. Var. 0° 10′ E.

Ras Bashuri (*Lat. 12° 43′ N., Long. 53° 34′ E.*)—From Ras Kadarma, the coast trends westward $4\frac{2}{3}$ miles to Ras Bashuri, off which, and joined to it by a narrow neck of land 50 yards in length, is a pyramidal rock about 150 feet high. Between the two points the water is deep close inshore and within 2 miles northward of Ras Bashuri soundings have been taken in 825 fathoms. Westward from the pyramidal rock, depths of from 5 to 20 fathoms are found at one mile from the shore.

Plan, Ghubbet Kallansiya, on chart 5.

Ras Samari.—Ras Bashuri, with the coast $1\frac{1}{2}$ miles westward to Ras Samari, forms the most northern part of Sokótra. The mountains, nearly 2,000 feet in height, rise in some places almost perpendicularly from the shore, and are fronted by a rocky beach. Between the two points, a part of the mountain side is covered with sand.

Bank.—Between Ras Samari and Ras Kallansiya, $2\frac{1}{4}$ miles apart, is an indentation of the original coast-line, which has, however, become so completely filled with sand as to form a mangrove swamp in what was the centre of the bay; and projecting from this, seaward, far beyond a line connecting the two points is an accumulation of sand, nearly all dry at low water, springs; from the north-western point of this sandbank, the depth increases from one fathom to 20 fathoms within the space of half a mile. It should be given a wide berth.

Ras Kallansiya (*Lat. 12° 42′ N., Long. 53° 30′ E.*), the eastern point of the bay, has four small granite peaks, by which it may always be known, as well as by the hills near them being covered in some places with sand.

GHUBBET KALLANSIYA is a bay about 3 miles wide, affording shelter in the North-east monsoon; its eastern point is Ras Kallansiya, and its western boundary is a point nearly 3 miles eastward of the bluff point Ras Baduwa, the north-eastern point of Ghubbet Shoab.

The village and mosque are in a grove of date and cocoa-nut trees, close to a fresh water lake about three quarters of a mile southward of Ras Kallansiya.

Depths.—The shore of the bay is fronted by a rocky reef nearly 2 cables wide, nearly all of which is dry at low water, springs. The depths in the bay under 10 fathoms are irregular, with overfalls; W. by N., at $7\frac{1}{2}$ cables from the mosque is a $2\frac{1}{2}$-fathoms patch on the edge of the 3-fathoms contour-line; from 20 fathoms, at less than $1\frac{1}{2}$ miles off the points of the bay, the soundings suddenly deepen to no bottom at 100 fathoms.

General charts 6a and 597.

Plan, Ghubbet Kallansiya, on chart 5. Var. 0° 10′ E.

Anchorage.—The best anchorage for a small vessel is in 4 fathoms, about 4 cables off the sandy beach, which is the best landing place, with the northern granite peak on Ras Kallansiya bearing N.E. by E. ½ E., and the mosque S.E. by E. Large vessels may anchor in from 7 to 10 fathoms, with the mosque S.E. about one mile. The bay affords no shelter in the South-west monsoon.

Tides.—It is high water, full and change, at Ghubbet Kallansiya at 7h. 20m.; springs rise 8 feet. The flood sets eastward.

Supplies.—Good water and firewood are plentiful; also milk, sheep, and goats, if a few hours' notice of their being required is given. A few fowls, beans, and pumpkins are procurable, and good fishing is to be had. The natives will take water off in their own boats, but vessels must supply casks.

Chart 5, Sokótra island.

Ras Baduwa (*Lat 12° 39′ N. Long 52° 25′ E.*) is a bluff point about 300 feet high, and is the western termination of Jebel Mali. It forms the north-eastern point of Ghubbet Shoab, described at page 477; from it the coast takes a sudden turn southward. Westward of the point there are depths of 20 to 34 fathoms for nearly 5 miles, with a rocky bottom and good fishing.

General charts 6a and 567.

CHAPTER XI.

ARABIAN COAST.

ADEN TO RAS SHARBITAT.

(*Lat. 12° 30′ N., Long. 45° 0′ E., to Lat. 18° 0′ N., Long. 56° 30′ E.*)

VARIATION IN 1909.—Variation changes from West to East in this chapter.

The northern shore of the Gulf of Aden, as far as and including the port and promontory of that name, are described in the concluding pages of Chap. VIII. Having in the last two chapters completed a detailed description of the western and southern shore of the Gulf of Aden, including Sokótra and adjacent islands, the description now reverts to the northern or Arabian shore, continuing eastward from Aden, where it was left at page 412.

Chart 6b, Gulf of Aden, sheet 2. Var. 1° 30′ W.

GHUBBET SEILAN.—From Aden, the coast trends northward for 15 miles, and then eastward for about the same distance, to Ras Seilan (*Lat. 13° 2′ N., Long. 45° 24′ E.*), thus forming Ghubbet Seilan, the deep bay whose shores are flat and sandy but rise gradually as Ras Seilan is approached. A low plain covered with stunted bushes extends from shore some distance into the interior. The depths in the bay are fairly regular, the 5-fathoms line being generally about one mile from the shore and the 20-fathoms line from 3 to 7 miles outside that depth.

From the British boundary eastward, the coast is inhabited by the Fadthli, a numerous tribe reckoned at about 15,000 souls, and as a general rule not to be trusted, whose territory extends in an unbroken line for nearly 100 miles along the shore, beyond Shukra and as far as Makátein. In the interior are the Abádil and Yafai tribes, spread over an extensive tract of country, including a portion of Jebel Yafai. All these coastal tribes are now under British protection. *See* page 404.

The Jebel Yafai range, which at its western end attains a height of 7,246 feet, averages about 6,500 feet above the sea, and extends nearly 100 miles east and west, direction varying between 20 and 30 miles inland. The Yafai territory is

Chart 6b, Gulf of Aden, sheet 2. Var. 1° 30′ W.

mountainous, with numerous valleys, producing coffee, wheat and millet.

CAUTION.—See caution, page 25, as to northerly current sometimes experienced setting strongly into Ghubbet Seilan. All vessels should be on their guard against it, but sailing vessels especially should avoid getting embayed with easterly winds. Several vessels have in former times been wrecked here and plundered by the natives.

Ras Seilan is a low round sandy point, with a few date trees growing near it and some large trees inland. The stream through Wadi Bana makes its way to the sea at Ras Seilan. About 1½ miles northward of the cape is the village of Sheikh Abdulla.

Soundings of less than 100 fathoms extend about 10 miles off Ras Seilan, dropping rather suddenly from 40 to 100 fathoms and to much deeper water directly afterwards; the 20 fathoms line is about 5 miles from the land, the depth decreasing gradually from thence toward the shore. Sand, shells, and broken coral is the general nature of the bottom.

COAST.—From Ras Seilan the coast trends in a north-easterly direction for 22 miles until abreast of Karn-am-Kulasi (or Saddle hill), a good landmark about 4 miles westward of Shukra and one mile inland, and from thence more easterly to Shukra, with a sandy beach the whole way.

Al-Asala is a small town 11½ miles north-north-eastward of Ras Seilan and about 2 miles inland; the population, chiefly agricultural, is about 500. The country immediately around is well watered and cultivated. South-eastward of Al-Asala is the tomb of a sheikh near the beach, and close to it the fishermen draw up their boats.

Plan of Shukra on sheet 10.

Barrow rocks are two dangerous rocky reefs, with depths of 2 fathoms on the north-eastern patch, and less than one fathom on the south-western; they are 1½ miles apart, and about 2 miles from the shore, rather more than half way between Al-Asala and Shukra, from which latter place the northern reef lies 4½ miles in a south-westerly direction.

To avoid these rocks, do not come into less than 15 fathoms while the dark Saddle hill, or Karn-am-Kulasi, bears between N. 22° E. and N. 34° W. A channel with from 5 to 7 fathoms water lies between the rocks and the reef fronting the shore to a distance of nearly one mile. The deepest water is near the rocks: the channel is nearly one mile wide between the north-

Plan of Shukra on sheet 10. Var. 1° 20′ W.

eastern patch and the 5-fathoms line on the shore side, but, abreast of the south-western patch, that line is less than 5 cables distant.

SHUKRA (*Lat. 13° 22′ N., Long. 45° 40′ E.*).—Shukra is the principal port of the Fadthli territory; the village is small, with a fortified stone building, the residence of the sheikh for several months in the year. It is about a quarter of a mile inland on the borders of a plain commencing at the foot of Jebel Fadthli, its eastern limit, having on the north of the valley leading to Wadi Bahrein, and a barn-shaped hill with a peak on its western end. A number of granite hills, terminating in a small eminence, form a point to the westward at some distance from the sea.

Jowari is cultivated here in large quantities, and in the vicinity of the village is a large grove of date trees.

Supplies.—Good water may be obtained at Shukra, also bullocks, sheep, poultry, onions, and pumpkins.

Trade.—The chief exports of Shukra are ambergris, coffee, jowari, and ghi. No fruit is grown except the plantain.

Anchorage.—A boat harbour with from one to 2½ fathoms is formed by a break in the reef fronting the shore to a distance of 5 cables. The mark for entering the harbour is the Sheikh's house on with the peak of the western end of the barn-shaped hill inland. There is very good anchorage in from 7 to 9 fathoms 4 to 5 cables outside the reef, with the Sheikh's house bearing N. by E., and Karn-am-Kulasi, or Saddle hill, about N. by W.

Tides.—It is high water, full and change, at 8h.; springs rise 6 feet; the flood stream sets westward.

Chart 6b, Gulf of Aden, sheet 2.

The Fadthli territory is stated as here extending inland about 80 miles. The country is chiefly mountainous, Jebel-al-Ures, a mountain 14 miles north-eastward of Shukra, attaining a height of 5,596 feet. Wadi Bahrein winds through these mountains, abundantly supplied with streams which flow into an extensive lake, from whence the valley takes its name. The largest village in this district is Mein, with a population of about 1,500, said to be 36 hours journey north-westward of Shukra. The natives are a fine bold-looking race, many of them inhabiting caves in the mountains; their religion is a lax state of Mohammedanism, the fast of the Ramadan passing almost unnoticed.

General chart 1012.

Chart 6b, Gulf of Aden, sheet 2. Var. 1° 20′ W.

COAST.—From Shukra eastward to Makátein, a distance of about 45 miles, the coast-line becomes irregular, jutting out into small points; for the first 13 miles it is flat, until Jebel Fadthli is approached, which range ascends gradually from the shore. At 16 miles eastward of Shukra is a ruin on the shore with a village northward of it about 3 miles inland, and a tomb about 7 miles farther eastward.

The soundings on this part of the coast extend a very short way offshore, there being from 20 to 30 fathoms about one mile from it, and more than 100 fathoms at 2 miles.

Jebel Fadthli is the lofty range of mountains extending about 35 miles east and west, about 5 miles inland and parallel with the coast-line; its summit is singularly broken into gables, peaks, and bluff points. The most conspicuous gable is rather eastward of the centre of the range and rises 4,000 feet above the sea (*Lat. 13° 35′ N., Long. 46° 7′ E.*); it is remarkable for an opening like a great embrasure or cleft, which gives it, from the eastward, the appearance of a double peak, from whence it descends almost perpendicularly towards the sea; from this gable the range declines slightly to the eastward, where a barn-shaped mountain attains a height of 3,950 feet. The highest point of the range is Jebel-al-Ures, before described, near the western end of the range. The valleys intersecting these mountains are thickly covered with vegetation.

Makátein Seghir, or the lesser, is a small anchorage for boats, formed by a projecting point 5 miles westward of Makátein. The water is shallow and the bottom rocky.

Plan of Makátein on sheet 10.

MAKATEIN (*Lat. 13° 25′ N., Long. 46° 26′ E.*) is an anchorage formed by a slightly projecting rocky point, from whence four rocky islets and a sunken rock project 2½ cables southward. A rocky 3-feet patch lies 3 cables S. by W. from the islets, with a 4-fathoms patch at 3 cables S.E. from it; another patch, of 1¼ fathoms, lies nearly half a mile eastward of the outer islet. Makátein is resorted to by native trading vessels for shelter during the North-east monsoon; the anchorage is on the western side of the islets, where the water is perfectly smooth when blowing hard from the north-eastward. The islets are white from the guano deposited by sea birds which frequent them in great numbers; it is used by the natives for agricultural purposes.

Makátein may be easily known by two black hills immediately eastward of it and close to the sea; there are others

Plan of Makátein on sheet 10. Var. 1° 10′ W.

3 or 4 miles farther eastward, but not so distinctly separate as the two mentioned; when approaching from the eastward, they resemble one long hill. At a quarter of a mile northward of the point, abreast of the islets, is a black ruin.

Tides.—It is high water, full and change, at Makátein, at 9h.; springs rise 6 feet; the flood sets westward.

Chart 6b, Gulf of Aden, sheet 2.

COAST.—At 6 miles eastward of Makátein is a rocky point named Sambahiá, and for 13 miles beyond, as far as Hauta village, a low sandy shore with rocky points prevails; it is also low westward of Makátein, and in many parts continues low for some miles inland, almost reaching the border of the Fadthli mountains. There are no dangers on this part of the coast; the 10-fathoms line is about one mile and the 100-fathoms contour-line about 6 miles from the shore.

AHWAR (*Lat. 13° 29′ N., Long. 46° 42′ E.*) is a town 5 miles inland of Hauta, situated on a wide plain and bounded on the north by high mountains; the tops of the houses only are perceptible from a passing vessel. It is the principal residence of the chief of the Aulaki tribe, and has a population of about 5,000, chiefly agricultural.

The Aulaki territory extends about 55 miles along the coast, between Makátein and Wadi Sanam, and is said to reach 200 miles inland. The coast is very flat, but about 35 miles inland is a high mountainous range of very irregular outline. The tribe is said to muster from 7,000 to 8,000 fighting men.

Supplies.—An abundant supply of good water may be procured at Ahwar, and also bullocks; fish may be obtained at Hauta.

Ras Aulaki is the low sandy point fronting Ahwar, on which stands the village of Hauta.

Sheikha Hurba (*Lat. 13° 31′ N., Long. 47° 6′ E.*).—The tomb of Sheikha Hurba, a female devotee, is 22 miles eastward of Hauta; this ancient shrine, being whitened, is a conspicuous object near the beach, and can be seen several miles. Wadi Sanam, the eastern limit of the Aulaki territory, is 10 miles eastward of this tomb; this valley is useless as a mark and cannot be distinguished by a vessel coasting at 3 or 4 miles from the shore.

Dives shoal, composed of sand, with a depth of about 16 feet, on which the French transport *Dives* touched, is

Chart 6b, Gulf of Aden, sheet 2. Var. 0° 50′ W.

stated to lie about 3 miles offshore, with Sheikha Hurba bearing N.N.E. ½ E. distant about 5½ miles.

COAST.—About 18 miles eastward of the tomb of Sheikha Hurba is the mosque of Sheikh Abdurrahman Baddas, and the small fishing village of Irka, standing on a low round sandy point; the mosque does not show well, but about 1½ miles eastward of it a square tower, which is a very conspicuous object, may be seen from a distance of 10 or 12 miles when approaching either from the eastward or westward. The coast from Hauta is nearly straight in an east by north direction to the village of Irka; from thence it turns north-eastward to Ras al Ghusáin, about 29 miles, and is low and sandy.

The depths off this part of the coast and as far eastward as Ras al Ghusáin are regular, the 20-fathoms contour-line being about 2 miles, and the 100-fathoms line from 4 to 6 miles offshore; the bottom is sand, coral, and shells.

Ras Safwan (*Lat. 13° 48′ N., Long. 47° 37′ E.*), a slightly projecting point about halfway between Irka and Ras al Ghusáin, is thinly covered with bushes on its extreme edge. Haura is a small village just north-eastward of Ras Safwan and is a place of no note; it has two square towers, each about 50 feet high.

Jebel Makanati is a projecting bluff 5 miles north-eastward of Ras Safwan, and forming with that point a small bay suitable for boats to anchor in. This whitish-looking bluff rises about 200 feet above the sea and is veined by dark strata; it terminates in sandhills, with a rock close off it.

Jebel Humeiri is a mountain range abreast of Ras Safwan and Ras Ghusáin; these mountains form the leading feature on this part of the Arabian coast, extending from 25 to 30 miles in a north-easterly direction; the highest central peak rises to a height of 5,284 feet, about 16 miles northward of Ras Safwan. The aspect of the whole range is dismal and rugged; when seen from either south-eastward or south-westward, its summit resembles the roof of a barn, and cannot be mistaken by a vessel approaching on these bearings.

The extensive valley of Wadi Maifáa is at the eastern foot of the Humeiri range; northward of the range, and, apparently, in a prolongation of the Wadi Maifáa, is the remarkable ruin named Nakb al Hajar, with many ancient inscriptions.

The territory of the Diyabi tribe extends along the coast for about 37 miles, from Wadi Sanam to Ras al Ghusáin, and inland

Chart 6b, Gulf of Aden, sheet 2. Var. 0° 40′ W.

northward of the Humeiri mountains. The tribe numbers about 800; its people bear a bad character.

Ras al Ghusáin (*Lat. 13° 54′ N., Long. 47° 48′ E.*) is a low rounded sandy cape 13 miles north-eastward of Ras Safwan, and has or had on it two large trees near the shore.

GHUBBET AIN.—Between Ras al Ghusáin and Ras al Aseida, 22 miles farther eastward, the coast-line falls back, forming Ghubbet Ain, a bay receding 6 miles from a line connecting the two points. On its shores or a short distance inland are the villages of Ain-ba-Máabad and Ain al Jaweiri; the former consists of a mosque and about 100 huts, the latter of about 70 huts; springs of water (as the name Ain denotes), date trees, and jowari abound. Farther eastward is the small fishing village of Jilláa, and the anchorage of Bal-haf.

The depths in this bay on the western side are about 20 fathoms at 4 miles offshore, decreasing gradually towards the shore; the eastern side is deeper, and here are depths of 100 fathoms within 3 miles of the shore.

Plan of Bal-haf, sheet 10.

Ras al Aseida (*Lat. 13° 57′ N., Long. 48° 10′ E.*), the eastern point of Ghubbet Ain, is conspicuous from having at its extreme a dark rocky conical hill not unlike a haycock, 160 feet high and discernible at a distance of 5 or 6 miles. The Ras forms three projecting rocky points, off which the water is deep, there being 40 fathoms within 2 or 3 cables of the shore, and 100 fathoms within a mile.

Bal-haf.—In a small bay westward of Ras al Aseida stood this small town, so named from a sheikh whose burial-place is contiguous. In 1902, the town with its Wahidi garrison was bombarded by H.M.S. *Perseus*, and the place is now described as not being easily distinguishable until close to. The bay affords good shelter during easterly winds; a sharp look-out must, however, be kept in the event of the wind changing to the westward.

Trade.—There used to be a small trade here, which probably will revive; it consisted principally in importations of coffee, cotton cloths, and coarse silks, brought from Makalla, Ash-Shehr, and Aden. There is no fresh water but that which is brought from a distance.

Tides.—It is high water, full and change, at 8h. 30m.; springs rise 5½ or 6 feet; the flood sets westward.

General chart 1012.

Plan of Bal-Haf on sheet 10. Var. 0° 30′ W.

Directions.—The nature of the bottom in Ghubbet Ain is sand, entirely free from rocks until the shore is neared in the eastern part, and the soundings are regular; but when standing towards Bal-haf care must be taken to avoid the rocky bank, extending half a mile from the shore, between one and 3 miles north-westward of Ras al Aseida. Entering the bay with an easterly wind, a sailing-vessel should round the point at about 2 cables, and should be prepared to meet the sudden gusts which may be expected on passing it and which frequently blow with considerable force. From abreast of the point, keep Black Barn hill about a point on the starboard bow in making for the anchorage, and anchor in 13 fathoms with that hill bearing N. ¾ E., and a white rounded hummock on its ridge 5 cables northward of Ras al Aseida, about east-north-east. As the bank of soundings is very steep, a good scope of cable is necessary to prevent a vessel dragging into deep water.

Chart 6b, Gulf of Aden, sheet 2.

COAST.—Eastward of Ras al Aseida, the coast-line takes a general easterly direction for about 30 miles, as far as Ras al Kalb; but for the first half of the distance, to Ras Makdaha, the shore is very irregular with many projecting points and small intervening bays.

Ras ar Ratl (*Lat. 13° 58′ N., Long. 48° 14′ E.*), 5 miles eastward of Ras al Aseida, is a remarkable round volcanic promontory of considerable height, with a hollow in the centre, apparently an extinct crater; on each side of the point is a bay suitable for boats. There is a small island about a quarter of a mile to the southward promontory.

Jebel Husn Ghoráb, 5 miles eastward of Ras ar Ratl, is a square-shaped dreary-looking brown hill, 456 feet in height, with steep sides. On the summit are some very interesting remains of an ancient city, from which it may be assumed that, in remote times, it was one of the most important places on the Arabian coast.

BANDER HUSN GHORÁB, a small secure and well-sheltered bay, 1½ miles wide and receding one mile to its head, lies immediately eastward of Jebel Husn Ghoráb, which forms its south-western point. Off and within the eastern side of the bay is a reef reducing the width of the entrance to about 8 cables and occupying nearly the eastern half of its area. At the head of the bay is the square tower and hamlet of Bir Ali and several adjoining hamlets.

Halánia island, a rocky limestone plain, three quarters of a mile long by half a mile wide, lies about one mile southward

Chart 6b, Gulf of Aden, sheet 2. Var. 0° 30′ W.

of Husn Ghoráb point, and is separated from it by a narrow channel. Several rocky points project from the island, and off its eastern side are rocky patches with from 2½ to 4 fathoms extending fully 4 cables from the eastern point in a south-easterly direction. Westward of the island, tolerable shelter may be found from easterly winds.

Sharan is a circular table-topped sandstone hill, 300 feet high and 3½ miles eastward of Husn Ghoráb; it is remarkable for a cavity or crater-shaped hollow full of water, called Kharif Sharan, the edge of which is fringed by an overhanging bank of mangrove trees. The diameter of the cavity is about 2,500 yards, and, in depth, it is reported by the Arabs to be fathomless; the water is very salt.

Directions.—In standing into Bander Husn Ghoráb, after rounding Halánia island in 8 or 9 fathoms, and at a safe distance in order to avoid the shoal extending from its eastern side, steer for the square tower of Bir Ali, taking care not to bring it northward of N. by E. ½ E. in order to avoid the reef, anchoring in 4 fathoms about a quarter of a mile offshore. Approaching the bay from the eastward, a vessel should not approach the eastern point to a less depth than 12 fathoms. During the South-west monsoon, a vessel may keep more to the westward, bringing the dark barn-shaped hill, Husn Ghoráb, to bear nearly south; there is no danger on this western side. The bottom is generally clear sand with an occasional patch of rock.

Ghutdhrin islets lie about one mile offshore, 4 miles eastward of Husn Ghoráb, and nearly abreast of Ras Khada, a rocky point at the foot of Sharan hill; there are one large and 2 lesser islets, having a 12-fathoms channel, 1½ cables wide, between the largest and least, and also a 7 or 8-fathoms channel between them and the shore. Between the two smaller islets it is almost dry at low water.

Sikkah or Jibus (*Lat. 13° 55′ N., Long. 48° 23′ E.*) is another islet rising 450 feet above the sea, about 5 miles southward of Ras Khada; it may be seen 28 miles distant. The summit is flat, and white with guano deposited by birds which resort hither in great numbers. There are no dangers about the island, and a vessel may approach it in any direction, there being 30 fathoms close to all round. The depths between it and the Ghutdhrin islets vary from 20 to 30 fathoms, and the 100-fathoms line passes 2 miles seaward of it.

Makdaha anchorage.—Ras Makdaha is a dark and moderately high point, it being the southern termination of a

Chart 6b, Gulf of Aden, sheet 2. Var. 0° 20′ W.

range of hills extending 10 miles inland; it forms the eastern limit of the bay of Makdaha, which is 3½ miles across and affords excellent anchorage and shelter from easterly winds. This bay is free from danger, with the exception of a sunken rock half a mile offshore on its north-western side; the soundings are regular and the shore bold to approach.

The little village of Makdaha is in the eastern angle of the bay; it affords no supplies and the water is indifferent. It is the residence of a chief, a tributary to the sultan of the Wahidi tribe, who derives the principl apart of his revenue from guano on the islets. The inhabitants are wholly dependent on other ports for food.

Jezirat Barraka, off Ras Makdaha, is a small precipitous limestone rock about 600 feet high, without a vestige of vegetation; between it and the Ras is a channel one mile wide, with a depth of 15 fathoms.

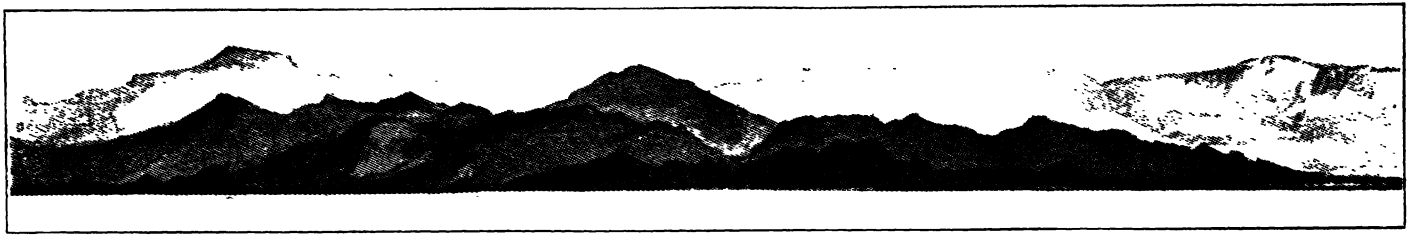
RAS AL KALB, or cape Dog (*Lat. 14° 2′ N., Long. 48° 40′ E.*), is a low round sandy cape, 13 miles eastward of Ras Makdaha, the intervening shore being also low and sandy. Great caution should be observed in approaching it during the night, as, from being so low, it is not easily discernible; there are 14 fathoms at one mile from the shore, and 50 fathoms about 2 miles off; attention to the lead, therefore, gives warning of approach to the shore.

Coast.—From Ras al Kalb the coast turns rather abruptly in a north-easterly direction for 38 miles as far as Makalla. The first part is very barren and sombre in aspect, sandhills extending for some miles inland. The distant mountains in the interior appear equally sombre, yet relieved by a very irregular outline, assuming forms of peaks, bluffs, &c., and rising almost precipitously from 2,000 to 4,000 feet above the sea.

RAS REHMAT, or cape of Wind's Death, 8 miles north-eastward of Ras al Kalb, is about 300 feet high, composed of limestone, and of a dark peaked outline. On its south-western face the sand from the plain has been swept up into a great heap by the South-west monsoon. It takes its name, "lull of the wind," a term frequently used by the Arabs when it falls calm, from the experience of dhows in running up the coast during the *tadh birch*, or early part of the South-west monsoon; the Arabs considering that when they round this point the violence of the wind has abated. From seaward, Ras Rehmat is remarkable as being the commencement of the bold, dark and precipitous land extending to within 15 miles of Makalla.

The Wahidi tribe consists of several thousand persons, and, it is said, can muster 2,000 matchlocks in case of war.

General chart 1012.



Ghubbet Kulun. Ras Burum, *N.W. by W., distant 17 miles.*

Chart 6b, Gulf of Aden, sheet 2. Var. 0° 20′ W.

They are a brave and hospitable race, civil and generous to strangers who treat them with familiar kindness, but cunning and revengeful when oppressed ; they are much respected and feared by their neighbours ; their inland towns are considerable and well populated. Ras Rehmat is the eastern limit of the Wahidi territory, which has a coast-line 60 miles in extent ; its only two anchorages are Bal-haf and Husn Ghoráb.

Ras Assassa (*Lat. 14° 12′ N., Long. 48° 51′ E.*), or Asr-al-Hamra (red footsteps), is a rocky point, being the termination to seaward of a rugged range of hills extending some distance inland. This cape is 6 miles north-eastward of Ras Rehmat, and in the valley between lies the town of Al-Ghaidar, about 4 miles inland amongst luxuriant date groves.

Between Ras Assassa and Ras al Himar, or the red cape, is a small bay in which is a hamlet belonging to people of the Buheishi tribe. Between Ras al Himar and the southern horn of Ras Burum, about 4 miles distant, is Ghubbet Kulun, another small bay in which the anchorage is indifferent.

The soundings off this part of the coast are deep, there being 60 fathoms at 1½ miles from the shore.

Plan of Bander Burum, sheet 10.

RAS BURUM is a bold dark craggy point, 9 miles north-eastward of Ras Assassa, composed chiefly of limestone ; its highest point is visible 38 miles distant ; a reef, steep-to, extends 3½ cables eastward from it.

BANDER BURUM (*Lat. 14° 20′ N., Long. 48° 57′ E.*) is the bay nearly 1½ miles wide between the northern horn of Ras Burum and the bluff point of Radham. It is a secure anchorage during the South-west monsoon, but is open to easterly and north-easterly winds. Landing is at times difficult on account of the surf and rocks on the beach.

The town of Burum is in the north-western angle of the bay ; it is surrounded by date trees and stands at the foot of an offset of the range of hills, about 1,100 feet high, which here extends down to the sea and forms a bold and rocky coast. This wretchedly built town, of which the population is about 500, as well as Fuwah, Al-Ghaidhar, &c., is under the chief of the Buheishi tribe, who has also several small tribes tributary to him. Ijilli, a white mosque on an eminence a short distance from the beach, may be plainly seen from the offing.

The territory of the Buheishi tribe extends along the coast from Ras Rehmat to Fuwah in the bay of Makalla, a distance

General charts 6a and 1012.

Plan of Bander Burum, sheet 10. 0° 20′ W.

of 25 miles, with a vast district inland. The tribe is called collectively Buheishi and is under one sultan, but is subdivided into four lesser tribes, each having its own name and chief.

The valleys inland are rich and beautiful, producing quantites of jowari ; they are bounded by purple-veined mountains which rise from 5,000 to 6,000 feet above them, whose summits in the cold season are at times snow clad.

Rain falls in November, December, July, and August, and sometimes heavy showers in April and May.

Supplies.—Good water is to be obtained at Burum, also firewood, sheep, fowls, eggs, onions, and pumpkins. Tobacco and dates are the chief produce, and a brisk trade is done during the South-west monsoon, when Burum becomes a port of refuge.

Anchorage.—The best anchorage during the South-west monsoon is in from 5 to 7 fathoms, good holding ground, with the town of Burum bearing N.W., but a ground swell rolls in. H.M.S. *Seagull* was at anchor here from January to March, 1881, during the North-east monsoon, in 7 fathoms, close inshore, with the southern side of the town bearing W. by N., and the northern point of the bay N. ¾ E.; the wind never blew sufficiently strong to make the anchorage at all dangerous, though at times the vessel rolled considerably. The current set continuously north-eastward, just outside the bay.

Chart 6a, Gulf of Aden, sheet 1.

From Radham bluff to Makalla, a distance of 14 miles, the coast is low and sandy, with high mountains in the background. Along this part the depths are regular, the 20-fathoms line being about one mile distant from the shore. As Makalla is approached, the beach becomes steeper.

Fuwah (*Lat. 14° 29′ N., Long. 49° 1′ E.*) is a small town about half way between Burum and Makalla, containing about 500 inhabitants.

Plan, Makalla bay, sheet 10.

MAKALLA BAY (*Flagstaff, Lat. 14° 31′ 15″ N., Long. 49° 6′ 50″ E.*).—This bay may be said to extend from Ras Burum to Ras Makalla, but the name is commonly restricted to the eastern portion of the bight between Fuwah and Ras Makalla ; in this part, at 2¼ miles north-westward of Ras Makalla, are the two small eastern and western bays, divided from each other by the point on which a portion of the town of

Plan, Makalla bay, sheet 10. Var. 0° 10′ W.

Makalla stands. Of these two bays, the western is the most frequented by boats; it is a small nook, with from one to 3 fathoms water, protected on the west by a reef almost dry at low water, which projects nearly half a mile from the shore; a sunken 9-feet rock lies a short distance south-westward from the main body of this reef, requiring caution when standing towards it.

The eastern bay is seldom used, owing to the swell which rolls in during the North-east monsoon.

Ras Makalla is a low neck of land projecting about 2 miles from the base of the hills, which here extend from the interior close down to the shore; it consists of three points, Ras Makalla, Ras Kodar, and Ras Marbat. Ras Makalla is the eastern point; about 3 cables southward of it is Ras Kodar, the southern extreme of the promontory; and 8 cables westward of it is Ras Marbat, with a ruined fort, by no means conspicuous, on it; about 1½ miles farther north-westward is the town of Makalla and the two little bays before described.

Rocky bank.—From 4 to 6 cables southward of Ras Kodar is a rocky bank 3½ cables long in a south-easterly direction, rather steep-to, and with from 3¾ to 4½ fathoms. The passage inshore of it has from 10 to 15 fathoms and appears to be clear of danger.

Along the whole of this coast the sea is remarkable for its clearness when calm and the water smooth, the bottom being then plainly visible in from 12 to 15 fathoms.

Anchorage.—The bank of soundings in Makalla bay on which anchorage may be obtained extends about half a mile from the shore, near the town, increasing to nearly one mile off Fuwah. A vessel may lie here in perfect security during the North-east monsoon; a good berth is about 2 cables from the point, and also from the reefs westward of the western bay, in from 7 to 10 fathoms, sand, with the minaret close to the shore, a very conspicuous object, in line with the fourth fort from the eastward N.N.E. ¼ E. and the flagstaff near the gateway westward of the town N.W. ⅞ N. The flagstaff on the governor's house formerly given as a mark is now not easily made out. The South-west monsoon blows home fresh, but as the sun declines the wind and swell decrease; often during the morning at this season it blows strongly from north-west.

Landing.—A stone jetty opposite the governor's house renders landing fairly easy.

General charts 6a and 1012.

Plan, Makalla bay, sheet 10. Var. 0° 10′ W.

Tides.—It is high water, full and change, at 8h. 30m.; springs rise 7 feet; the flood sets south-westward.

Makalla, next to Aden the principal commercial town on the southern coast of Arabia, is partly built on the narrow rocky point as described and partly at the foot of a range of reddish limestone cliffs rising to a height of about 300 feet immediately at the back of the town, on which are four conspicuous towers for the protection of the place; it has a picturesque appearance from the sea. Almost directly above this remarkable level range of cliffs, the flat-topped summit of Jebel al Kara, rises 1,300 feet above the sea, and may be seen in clear weather at a distance of 42 miles. The northern portion of the town is built on ground sloping from the base of the hills to the bay, and is enclosed on the western side by a wall extending to the shore, with only one entrance gate. The governor's house is a large square building; the others are chiefly huts, intermingled with stone houses and two mosques. The houses on the point are of stone and are a better description, but many new and substantial houses, one for the governor, are now being built westward of the town with good road communication between.

Although the immediate vicinity of Makalla is particularly barren, it is not so a short distance inland. About one mile up the valley westward of the town are large date groves and gardens belonging to the governor of Makalla, with watch-towers, occupied by his soldiery, to protect them from incursions of Bedouins. The gardens are irrigated by a stream of water led through them from a rivulet which has its source at a place called Bokharen in a rocky ravine close by; the stream flowing from it is surrounded by date trees. The inhabitants of Makalla obtain their supply of water by means of an iron pipe laid from the source of this same stream.

Makalla is ruled by a nakib or governor, one of the Hamum tribe, who derives his revenue from customs, duties levied on imports, and harbour dues. The population is a mixed one, consisting of people of many nations.

Supplies.—Good water is to be obtained from the spring before mentioned, but it is cheaper for shipping at Bander Burum. Firewood, bullocks, sheep, fowls, eggs, honey, and some kinds of vegetables, are to be had in abundance and are moderate in price. A quantity of fish may be taken with the seine in the western bay.

Trade.—A very considerable trade is carried on with India, the Somáli coast, the Red sea, and Maskat. The exports consist

Plan, Makalla bay, sheet 10. Var. 0° 10′ W.

of gums, hides, large quantities of senna, and a small quantity of coffee. The imports are chiefly cotton clothes, lead, iron, crockery and rice, from Bombay; date and dried fruits from Maskat; coffee, jowari, and bajiri from Aden; sheep, aloes, frankincense, coffee, and dye from Berbera and other African ports. Steam-vessels of the Bombay and Persian Gulf line frequently call here, and Messrs Cowasjee, Dimshaw's small steamers run between Aden and Makalla about bi-monthly during the trading season. A considerable coasting trade is carried on by native sailing craft, bágalas and dhows, of from 100 to 300 tons, passing to and from the Persian Gulf and Red sea. The greatest number arrive during the date season, sometimes as many as twenty or thirty a day, some with goods, others with pilgrims. Traffic in slaves still exists.

During the South-west monsoon, a considerable portion of the trade is diverted to Bander Burum, which then becomes the secure anchorage, and in the future, as the commercial development of southern Arabia advances, it is quite possible that these two anchorages will become of great importance as alternative ports available for all classes of ships all the year round.

Climate.—The weather in the bay is exceedingly warm during the middle of the day, and on shore the heat is excessive. Land and sea breezes, with showers of rain tending to cool the air, are, however, occasionally experienced from October to April, and often in June and July.

Chart 6a, Gulf of Aden, sheet 1.

COAST.—From the head of Bander Ruweini, the little bay on the eastern side of Ras Makalla, the coast trends eastward about 40 miles in an almost unbroken line of low sand as far as the cliffs of Hami. The soundings throughout are regular but deep, the 20-fathoms line being generally one mile offshore and the 100-fathoms line about 3 miles, with a bottom of sand and shells.

Bander Ruweini, the small bay north-eastward of Ras Makalla, has from 4 to 6 fathoms close inshore, from whence it shelves into deep water. Native trading vessels find shelter here during the South-west monsoon.

Rukub, a village 2 miles eastward of Bander Ruweini, has a large and ancient mosque. The inhabitants appear to be chiefly occupied in fishing.

Buweish, a village about 3 miles north-eastward from Rukub and 1½ miles inland, stands in a well-watered valley surrounded by date groves.

General chart 1012.

Chart 6a, Gulf of Aden, sheet 1. Var. 0° 10′ W.

Shuhair, once a thriving town, is on the coast 13 miles eastward from Rukub. An old fort near the village is the most conspicuous object and the first seen on nearing the spot.

Suku-al-Basir is a town about 4 miles inland northward of Shuhair and said to contain 4,500 inhabitants. Its mosques may be distinctly seen from the sea. Tobacco, dates and vegetables, with good water, are to be obtained here.

JEBEL DHEBA, an isolated oblong table-topped hill close to the shore, is a good landmark for making Makalla from the eastward, from which place it is distant about 20 miles. Zaghfa is a village on the shore 4 miles eastward of Jebel Dheba; 2 miles beyond it is the ruined village of Marir, where there is an abundant supply of water.

Plan, Ash-Shehr roads, sheet 10.

ASH-SHEHR (*Lat. 14° 44′ N., Long. 49° 35′ E.*), 8 miles eastward of Jebel Dheba, is the chief town of the district of this name and extends about one mile along the shore; on an eminence is a fortified castle, the residence of the jamadar, visible from seaward before any object in the town. There is also a mosque and a Custom-house. The town is triangular in form with high walls round it; the dwellings are much scattered. The population is about 6,000.

Supplies.—Water is bad, sheep and vegetables may always be obtained.

Trade.—In 1880, Ash-Shehr had not much trade except in dried fish. The jamadar and merchants owned several vessels, but the chief trade is carried on by vessels coasting on speculation. The manufactures of the town are small, consisting principally of coarse cotton cloths and gunpowder.

Anchorage.—The anchorage off Ash-Shehr is an open roadstead. The best berth is in 7 or 8 fathoms, sand and shells, from 7 cables to one mile offshore.

Jebel Yu'alif is an isolated hill 4 miles north-eastward of Ash-Shehr, on which are the remains of a wall and terrace. It is a good landmark for making the place. Westward of it and about 2½ miles inland from Ash-Shehr, is a hot spring at Taballa.

Chart 6a, Gulf of Aden, sheet 1.

About 6 miles eastward of Ash-Shehr on the sea shore is a ruin named Kuridth. The soundings continue regular and the coast eastward of Ash-Shehr safe to approach, the 10-fathoms line being about one mile from the shore and the 100-fathoms line from 3 to 5 miles.

Chart 6a, Gulf of Aden, sheet 1. Var. 0° 10′ W.

HAMI, the next village, is 14 miles eastward of Ash-Shehr and lies in a ravine at the foot of the dark double hill of the same name, with a date grove and cultivated ground about it. There is very little trade. Hot springs of a temperature of about 140° Fahrenheit are numerous in the vicinity of this village.

Anchorage about one mile offshore may be had in 7 or 8 fathoms, sand, shell, and broken coral.

Supplies.—Water here is indifferent and supplies difficult to obtain, sheep and vegetables being the only articles procurable.

Plan of Sharma, sheet 10.

SHARMA BAY.—Between Hami and Ras Sharma, 9 miles farther eastward, the coast forms a bay receding 2 miles, with sandy bottom and regular depths. Near a small point in the bay and on a rocky eminence 4 miles north-westward from Jejírat Sharma, and half a mile inland, stands the ruined fort of Husnal-Museinaa; and between this point and Ras Sharma is Sharma bay, considered the best anchorage in this neighbourhood during the North-east monsoon.

Ras Sharma (*Lat. 14° 48′ N., Long. 49° 57′ E.*) is a small headland forming the eastern limit of the bay. At 3 cables westward of it lies Jezírat Sharma, a small rock 70 feet high. The channel between is 1¾ cables wide, with 5 and 6 fathoms water and deepening towards the rock. Immediately northward of the cape are the hills Mashar-Sabir and N.W. Bluff, 170 feet above the sea.

Anchorage.—Very good anchorage may be found in Sharma bay in 4 or 5 fathoms, with Ras Sharma bearing S.S.E. and distant about half a mile; but that most frequented is off the village of Al-karn, near the head of the bay, where small vessels may lie perfectly secure in from 2 to 4 fathoms.

Tides.—It is high water full and change, in Sharma bay, at 9h.; springs rise 8 feet; the flood sets westward.

Chart 6a, Gulf of Aden, sheet 1.

Dis is a walled town 2 miles inland from the head of Sharma bay; 3 miles farther inland is the village of Thubba. Both places are noted for their hot springs, which are of peculiar efficacy in rheumatic complaints.

COAST.—From Ras Sharma, the coast trends eastward 8 miles to Ras Baghashwa, presenting a succession of limestone and chalk cliffs rising almost perpendicularly 300 and 400 feet

Chart 6a, Gulf of Aden, sheet 1. Var. Nil.

above the sea, and visible from a distance of 25 miles. The shore throughout is bold, there being in some places 5 and 6 fathoms water within a few yards of the cliffs; the bank of soundings extends 5½ miles offshore, and the 20-fathoms line is 2 miles distant from it.

Ras Baghashwa (*Lat. 14° 49′ N., Long. 50° 5′ E.*), a rocky point 300 feet high and the eastern termination of this part of the coast, has on it the ruins of an ancient town; they are close to the cliff and cannot fail to strike the eye of those passing along the coast. The small village of Baghashwa is a little eastward of the Ras, and at 4 miles westward, in a gap in the cliffs fronted by a sandy beach, is the village of Dhafghan, off which is a boat anchorage. About 5 miles inland is Jebel Hamún, a sandhill, in the vicinity of which are some curious ancient inscriptions in the same character as those of Husn Ghoráb. There are several springs of good water here and the land is well cultivated.

Aspect.—A high range of mountains extends parallel with the shore from 10 to 15 miles inland. Commencing eastward of Makalla, they bear the name of Jebel Jambúsh, then Jebel bin-Shamayik, and a remarkable bluff towards its eastern end is to be seen on a still more distant range; next follows Jebel Asid (mount Lion), which stretches away north-eastward towards Ras Farták.

From Ras Baghashwa to Ras Kosair, a distance of 13 miles, the coast-line is low and sandy with an east-north-easterly trend. The soundings are regular, the 20-fathoms line being about 2 miles and the 100-fathoms line about 6 miles from the shore; the bottom, generally, is sand and shells.

Hamum tribe.—The territory of the Hamum tribe extends along the coast from Fuwah to Museinaa, in long. 50° 40′ E., a distance of about 100 miles. The tribe is subdivided into ten clans, each having its own name and separate chieftain; but, collectively, they are called Hamum, and are under the dominion of the sultan.

Plan, Ras Kosair, sheet 10.

RAS KOSAIR (*Lat. 14° 54′ N., Long. 50° 17′ E.*).—This low rocky point has two small rocky islets close westward of it. A reef, partly dry at low water, extends south-eastward from these islets to a distance of 4 cables southward of Ras Kosair. Boats find shelter between this reef and the Ras, as also behind a reef about 7½ cables north-eastward of the Ras.

Good anchoring ground, but with no shelter, may be found off Ras Kosair reef in 12 or 14 fathoms.

General charts 10b and 1012.

Plan, Ras Kosair, sheet 10. Var. Nil.

One mile inland from Ras Kosair is Kosair village, containing a few stone buildings, but consisting chiefly of huts. The inhabitants have some few boats and catch abundance of sharks, the tails and fins of which, when dried, they export to Maskat and Bombay, from whence they find their way to the Chinese markets, fetching good prices.

Half a mile north-westward of the village is a ruined square fort and a date grove; and 1½ miles farther westward is the scattered hamlet of Al Kúrain.

Chart 6a, Gulf of Aden, sheet 1.

Coast.—From Kosair, the coast trends east-north-eastward with a slight inward curve for about 36 miles to Tanún; it is low sandy uncultivated and has throughout a dreary appearance. The soundings are irregular and the bottom rocky with sudden overfalls; the lead, therefore, affords but little guide. The round tower at Al-Harrah, a small village 4 miles north-eastward of Kosair, is conspicuous, and Serrar, another small village 2½ miles farther on, has an abundance of date trees near the houses.

Raida (*Lat 15° 1′ N., Long 50° 26′ E.*), a small town about three quarters of a mile inland, is the principal place on this part of the coast, being the residence of the chief who rules over the Kasaidi clan of the Hamum tribe; his territory extends from Ras Baghashwa to Muscinaa. Husn-el-Kathiri, a ruined fort, is 2 miles inland and 3 miles westward of Raida. Several trading boats belong to Raida. The exports are frankincense, aloes, ambergris, and sharks' fins and tails. The population is estimated at about 700.

Many hot springs found here are said to possess great medicinal virtue; and, judging from the number of villages and ruins, and from the cultivation which always accompanies the presence of water here, this is probably, next to Dhofar, the most fertile part of the coast.

The soundings off Raida are deep, and there is no safe anchorage, there being a depth of 20 fathoms within 2½ cables of the beach. Opposite the town of Raida, and close to the shore, is a deep hole, probably an ancient crater, with from 120 to 125 fathoms, and with from 20 to 40 fathoms round it.

Among the most remarkable features on this coast is a series of three horizontal effusions of black basalt, on the plains between the neighbourhood of Raida and Wadi Masaila. These are called *harik* (*Burnt place*) by the Arabs. Each has one or more cones about 100 feet above the level of the surrounding ground; and, around each cone, for a varying extent, is a low

Chart 6a, Gulf of Aden, sheet 1. Var. Nil.

field or tract of basalt, so strikingly defined by its blackness and the light colour of the plain over which it has spread, that, but for its being unattended by any active signs of volcanic eruption, might be taken for a semi-fluid mass of lava.

In the centre of the first tract, in the vicinity of Raida, are four cones; and this effusion having taken place over ground for the most part 100 feet above the level of the sea, has found its way into the watercourses and appears at their openings on the shore in black rocks, contrasting strongly with the white colour of the limestone on each side. The plains of the lower mountains here also appear to be darkened, perhaps by ashes ejected from the cones or craters. There is, of course, hardly any trace of vegetation, and the heat from it in the month of May is almost insupportable.

The next cone is opposite Wadi Sheikhaur, about 9 miles from the last and about 3 miles inland.

The last cone is about 4 miles westward of Sihut. Its effusion has extended nearly to Wadi Masaila on the east, and joins with that of the cone on the west.

Connected with these volcanic effusions appear to be Abd-al-Kuri or Palinurus shoal, and the deep hole, already described, off Raida. Such irregularities in the bottom of the sea do not exist elsewhere throughout the whole extent of this coast.

Chart 10b, South-east coast of Arabia.

Museinaa (*Lat. 15° 3′ N., Long. 50° 38° E.*) is an ancient ruin on the shore 12 miles eastward of Raida; the land about it is swampy and abounding in mangrove trees. The remains indicate the site of a large town.

This is a most interesting portion of the coast, containing as it does so many ruins and ancient inscriptions bearing witness to former greatness, and to a probably fertile and populous region, now almost desolate, and its few inhabitants nearly always at strife with their neighbours.

Wadi Sheikhaur, a valley 10 miles inland, easily distinguished by a remarkable gap in the mountains that encompass it, has within it many inscriptions similar to those of Husn Ghoráb, &c.

PALINURUS SHOAL, or **Abd-al-Kuri** (*Lat. 14° 55′ N., Long. 50° 40′ E.*), is a patch of rock and coral, one mile in length, off Museinaa; from the shoalest spot of 2½ fathoms, the ruin of Museinaa bears N. by W. about 8½ miles, and is nearly in line with the eastern bluff of Sheikhaur gap, which lies

Chart 10b, South-east coast of Arabia. Var. Nil.

fairly open; the sandy beach of the mainland is not visible from the shoal.

Caution.—It is advisable to avoid this spot entirely, either by keeping well inshore or by keeping a good offing of from 12 to 15 miles. The depths around the shoal vary suddenly and do not always decrease on approaching it On its western and northern sides there appears to be a narrow gut of deep water of 140 fathoms, with from 40 to 80 fathoms close to it.

COAST.—Between Museinaa and Ras Ekab, about 42 miles farther eastward, the coast-line is almost straight, low and dreary, with a gradual ascent to the Sheikhaur mountains, their eastern termination in Jebel Asid forming the western side of Wadi Masaila. At 12 miles eastward of Museinaa is the village of Tanún, and 12 miles farther on is the deserted village of Sharkhut.

The depths off this coast are regular and the shore safe to approach; the 20-fathoms contour-line is about 5 miles, and the 100-fathoms line from 10 to 18 miles from the shore.

Wadi al Masaila is a valley 6 miles wide, having on its western side the high range of Jebel Asid, and on its eastern side the high range which terminates on the coast at Ras Ekab; it forms the line of communication between the sea-coast towns and the province of Hadramaut. On each side of the entrance is the ruin of a fort. The valley is well watered by running streams, and villages and date groves are numerous; the inhabitants are of the Mahra tribe. Of all the valleys opening on the sea on this coast, Wadi Masaila is certainly the grandest, and, running inland, it appears to divide the mountainous land of Southern Arabia into distinctly separate tracts. Its width is great and the height of its sides appear enormous; its summits are usually cloud-capped.

SIHUT (*Lat. 15° 12′ N., Long. 51° 12′ E.*)—This large, well built, and cleanly kept town is situated 35 miles eastward of Museinaa, 8 miles westward of Ras Ekab. The scattered stone buildings in the neighbourhood were evidently erected with a view to defence against small arms. Its population, of the Mahra tribe, varies according to the trade and season, and is estimated at times to number 10,000. Considerable intercourse with the interior takes place through Wadi Masaila, and a great trade is carried on with places in fish oil in the Persian gulf. Steam-vessels of the Persian Gulf Company call here occasionally, also small steamers from Aden. The traders of Sihut have several coasting craft with which they carry on a trade in grain; smaller boats are also employed in shark fishing.

General chart 1012.

Chart 10b, South-east coast of Arabia. Var. 0° 10′ E.

About 4 miles westward of Sihut is the village of Darfut, with a date grove.

Supplies, such as sheep, fowls, milk, and eggs, are plentiful and cheap.

Anchorage.—The anchorage off Sihut is an open roadstead; regular depths of from 7 to 9 fathoms, sandy bottom, extend some four miles offshore. A good berth in 5½ fathoms, mud, is with the large white house in the town bearing N.W., and Ras Sharwein just open of Ras Ekab.

Ras Ekab is a high, red, sloping, rocky point; between this point and Ras Atáb, a distance of 8 miles, are three bluffs, nearly equidistant, forming between them small bays with sandy beaches, some of which afford shelter for small boats in the North-east monsoon. A few fishermen live in scattered spots along the coast.

RAS ATÁB (*Lat. 15° 17′ N., Long. 51° 26′ E.*) is moderately high, but terminates in the low point which forms the western boundary of Bander Liban.

Atáb.—At 2 miles north-eastward of Ras Atáb and one mile inland is the town of Atáb, having three mosques, of which the western one has a minaret. The population is about 400. The town is under the government of Kishin. At one mile westward of the town is a date grove, and to the eastward is a well of good water.

Bander Atáb or Liban has regular depths, and at its eastern limit, under Ras Sharwein, affords some slight shelter from north-easterly winds. With a fresh sea breeze, there is considerable surf on the beach. The shore of this bay, if such it can be called, is sandy, with a gradual ascent from the beach; in some parts the sand is blown high up against the face of the hills.

Except a few trees on the summit and sides of the mountainous tract between Ras Sharwein and the neighbourhood of Raida and Ras Baghashwa, the whole coast is barren and uncultivated.

RAS SHARWEIN (*Lat. 15° 21′ N., Long. 51° 39½′ E.*).—Ras Sharwein, separating Bander Atáb from Kishin bay, is a high, dark, perpendicular cliff; the highest peak, 750 feet above the sea, is about 2 miles from the point, gradually sloping towards the sea in a wedge-like form and terminating in cliffs from 80 to 150 feet in height. About 2¼ miles westward of the Ras are two remarkable sugar-loaf peaks close together, commonly known by the name of the Ass's Ears; they may be

Chart 10b, South-east coast of Arabia. Var. 0° 10′ E.

seen 30 or 40 miles distant, but do not show their characteristic feature when bearing eastward of north. The Ras is bold, there being deep water close under the cliffs. *See* view on chart 10*b*.

Ras Sharwein and Ras Darja, presently described, are very similar in appearance ; each has a large quantity of sand blown up the face of hills on its western side, and, as the currents are somewhat uncertain in the neighbourhood, care must be taken in thick weather not to mistake the one for the other.

Plan, Kishin bay, chart 10b.

KISHIN BAY is formed by the projecting headlands of Ras Sharwein and Ras Darja, 13 miles apart. The depths are regular, there being from 8 to 10 fathoms water nearly two miles from the shore, gradually decreasing towards the beach. During the North-east monsoon, there is a heavy ground swell and a high surf on the beach, which renders landing dangerous except in a nook immediately westward of Ras Darja, where small trading boats land their goods. The shore of the bay is low and sandy near the sea, having a high range of hills in the background, with a barren tract of undulating sandhills intervening.

Anchorage.—The best anchorage is in Bander Lask, the western part of Kishin bay, in 4½ or 5 fathoms, half a mile from the shore, with the Tomb bearing West, and the extreme of Ras Sharwein S.S.E. ; here vessels are well sheltered from the South-west monsoon and lie in comparatively smooth water. In other parts of the bay, a heavy swell rolls in at that season.

Kishin is a large straggling town at the head of the bay and about a quarter of a mile from the beach. It is one of the principal ports of the Mahra tribe and the residence of their sultan.

The population is small and they have only a few trading and fishing-boats. A small trade in salt and dried fish is carried on with the Persian gulf, Zanzibar, and the western coast of India ; the imports are jowari, rice, cotton cloths, dates, coffee, and sugar.

The village of Suk, near which is a small khor or salt water lake and a few date trees, is 2½ miles eastward of Kishin ; and, 1½ miles farther on is Hafat, another small village.

Fish are plentiful off the coast, and of excellent quality ; they form the staple article of food with the natives.

Supplies.—It is almost impossible to get supplies of any kind at Kishin. Fish can be caught in Bander Lask, the southern part of the bay, but cannot be bought.

General chart 1012.

Plan, Kishin bay, chart 10b. Var. 0° 10′ E.

Water.—Good water is procurable at Kishin from a well westward of the town.

Chart 10b, South-east coast of Arabia.

RAS DARJA (*Lat. 15° 27′ N., Long. 51° 51′ E.*), the eastern point of Kishin bay, is precipitous, varying from 200 to 400 feet in height. The sea breaks against it with great force during the South-west monsoon, forming large caves at its base, which is of limestone formation. The point is bold, having 5 fathoms water close to the cliffs, which extend from the extreme of the point to the beach on either side.

Rock.—A sunken rock lies 3¼ miles north-eastward of Ras Darja and about 8 cables from the shore. A short distance inland abreast of this sunken rock is Khor Maghsi, a small salt water lake, no doubt at one time connected with the sea.

Anchorage.—Between the sunken rock and Ras Darja there is complete shelter and good anchorage for a small craft during the South-west monsoon.

Coast.—From the cliffs of Ras Darja to those of Ras Farták, a distance of 25 miles nearly in an east-north-easterly direction, the shore is low and sandy, sandhills rising gradually towards the interior, and having a high range of hills in the background; the whole is barren, with the exception of stunted bushes and some patches of cultivation near the villages.

The depths off this part of the coast are regular, the 10-fathoms line being about one mile from the shore; the 100-fathoms contour-line is about 20 miles offshore at Ras Darja, but decreases its distance to 6 miles off Ras Farták.

Sakr (*Lat. 15° 33′ N., Long. 51° 58′ E.*) is a straggling village in a date grove close to the beach about 8 miles eastward of Ras Darja, with a population of from 500 to 600. On some low cliff south-westward of it stands a white mosque. A considerable quantity of grain is grown in the vicinity. A supply of good water is to be obtained here. About 3 miles eastward of Sakr is a fortified house at the west extreme of a village unnamed.

Haswein is a village with some date trees near, about 9 miles eastward of Sakr and containing 500 inhabitants, who subsist chiefly on fish and also carry on a small coasting trade in it. Good water is to be obtained here.

General chart 1012.

Chart 10b, South-east coast of Arabia Var. 0° 10′ E.

Kesid is another fishing village, containing about 150 persons, at the base of the high land on the western side of Ras Farták. It has no trade of its own and its people are miserably poor, but off this village is the usual anchorage for boats trading with the inhabitants of the small valley on the western side of Ras Farták, and this district includes the town of Wadi and other villages, as presently described.

At 1½ miles from the beach are some date groves, with the villages of Dhekrabait on the eastern side and Kadifut on the western side of the grove, each containing about 300 inhabitants. There are several wells of good water, and the land is slightly cultivated; there are also two small salt water lakes in the vicinity, from which the natives make salt for exportation.

Wadi, one of the strongest towns of the Mahra tribe and having three or four forts for its protection, lies about 3 hours' journey from the landing place at Kesid, following the valley at western foot of the Farták mountains; it is not shown on the the chart. The population amounts to about 600 souls; they, in common with the whole of the Mara tribe, bear an indifferent character.

Wadi is a place of considerable trade and its people own several coasting craft, its port being Kesid, before mentioned; they carry on a trade with Mangalore, Maskat, and Zanzibar, touching at other ports on their way. The principal exports are salt, salt fish, and shark fins. The imports are rice and cotton cloths from India; staves, tobacco, and wood for boat building, rafters from Zanzibar and the African coast; and dates from Maskat.

It was, formerly, the largest slave-dealing town on the coast; great numbers of slaves being imported annually and sold to their own and other tribes.

RAS FARTÁK *(Lat. 15° 38′ N., Long. 52° 16′ E.)* is bold and safe to approach, there being 9 to 10 fathoms water close to the cliffs, 20 and 30 fathoms at one mile, and 100 fathoms about 6 miles from the shore. It is a lofty mountainous headland about 2,500 feet in height and visible at a distance of 60 miles on a clear day; next to Ras Sakar, it is the highest and largest promontory on the coast.

The sea-cliff, which at Khalfut, 12 miles to the northward, is about 50 feet above the sea level, increases rapidly in height with the land and soon arrives at a perpendicular escarpment of 1,900 feet, a height which it maintains onwards to the summit

Chart 1056, South-east coast of Arabia. Var. 0° 10′ E.

of Ras Farták. It is by far the grandest escarpment on the south-eastern coast of Arabia, being uninterruptedly perpendicular from top to bottom for an extent of 6 miles.

No part of this range has any vegetation except near the summit, and this chiefly on the western side where the range slopes gradually to the plain below. Indeed, the barrenness of the Farták range generally, as well as that of the land side, seems to indicate that this part of the coast does not catch the rains of the South-west monsoon.

From the extreme of the cape, the cliffs extend in a northerly direction for about 8 miles, they then become lower and irregular for a farther distance of 9 miles, when they end in the sandy beach off the village of Tabut, the rocky projections forming several small bays with deep water.

When about 30 miles off Ras Farták in a southerly direction it appears like an island with a gap in the middle. It is supposed to be the ancient Syagros, from its resemblance to a boar's head when seen at from 20 to 30 miles, either from west or east.

The Current, which begins to set east-north-eastward along the south-eastern coast of Arabia early in April, is apparently deflected at Ras Farták, and strikes the coast again about Damkut in Ghubbet Kamar ; its average strength is 2 miles an hour. During the North-east monsoon it runs in the opposite direction at one mile an hour.

GHUBBET KAMAR.—At Ras Farták the coast takes a sudden turn northward for about 40 miles, when it curves away in an east-north-easterly direction for nearly 80 miles to Ras Sakar, forming the extensive bay Ghubbet Kamar, which recedes about 28 miles from a line connecting the two capes.

From the high land of Farták the coast is low near the beach, with high land in the interior for about 45 miles, until near the village of Al-Jowhari in the vicinity of the Falik mountains ; eastward of which mountains is the high range of Jebel Kamar, varying in height from 3,000 to 4,000 feet, and approaching close down to the sea.

The depths in Ghubbet Kamar are irregular. Off the low sandy shore at the western end the 10-fathoms line is about 3½ miles from the shore, and the water deepens to the 100-fathoms contour-line at about 13 miles from the beach. But, as the high land of Falik is approached, and from thence to Ras Sakar, the water becomes very deep and the coast bold, in

Ras Fartak. *W. by N., distant 25 miles.* *White limestone cliffs.*

Chart 10b, South-east coast of Arabia. Var. 0° 20′ E.

some parts there being no bottom at 100 fathoms within a mile of the shore; consequently there is no safe anchorage for sailing vessels, neither is there any place of shelter along this whole extent of coast. Steam vessels however would find convenient depths and anchorage during offshore winds in any portion of the bay. *See* Weather, below.

Supplies.—Bullocks and sheep are generally plentiful at all the villages in Ghubbet Kamar. Vegetables are not procurable, and there are scarcely any signs of cultivation.

Weather.—From about the middle of June the South-west monsoon blows strongly with a heavy sea; the premonitory swell of the monsoon commences to roll into the bay early in the month of April, causing a very heavy surf on the beach. During this season most of the people retire to the mountains. Rain is uncertain, sometimes falling in abundance, but often the season passes without any. As a general rule, the winds, except as stated, are light and variable in the bay.

Ras Fintás (*Lat. 15° 47′ N., Long. 52° 14′ E.*), the first headland northward of Ras Farták and distant 9 miles from it, is a bluff about 200 feet in height, having immediately over it a conical hill named Fintás peak. At this point the high land recedes from the shore and trends far away north-westward. At 2 miles northward of Ras Fintás there is a low bluff point forming the northern boundary of a sandy bight in which is the village of Nishtun.

North of Nishtun is a bay in which is Khor Khalfut, a creek about 2 cables in length, with 6 feet water. Boats of 30 and 40 tons are hauled up here during the South-west monsoon, their crews occupying a few temporary huts until they put to sea again.

From Khor Khalfut the coast trends northward 20 miles to Al-Ghaidtha, the largest town in Ghubbet Kamar and one mile from the beach. The small villages of Tabut, Herut, and Heraiyak are on this part of the coast, but about a mile inland. Between the first two, and about 3 miles from the beach, is a small saddle hill.

From Al-Ghaidtha the coast trends north-eastward about 20 miles to Al-Jowhari, a white tomb 3 miles from the beach with a few huts near it. The intermediate shore is also low, and about midway is the village of Eirub. About 3 miles southward of Eirub, and close to the sea, are some date trees and Kabr Khaihul tomb.

General chart 1012.

Chart 10b, South-east coast of Arabia. Var. 0° 20′ E.

Between Khalfut and Eirud the 10-fathoms line of soundings is about 3 miles offshore; the depths then rapidly increase to 20 fathoms, and from thence off into deep water. In this part of the bay very weak tidal streams prevail, but they are accompanied by strong ripplings in places rather alarming to persons unacquainted with their existence.

The Falik mountains approach close to the sea at 9 miles eastward of Al-Jowhari, and from thence trend west-north-west until they join the Farták range; their average height is about 2,000 feet. From the point at which they reach the shore the coast trends in almost a straight line to Ras Sakar, the mountains rising abruptly from the sea, with occasional small patches of sandy beach.

Wadi Shaghut is the valley between the Falik and Athub ranges of mountains, the former terminating in a sandhill, the latter in a dark bluff point. Off this place, the bank of soundings extends 7 miles, with overfalls near the edge. There are 10 fathoms water within half a mile of the shore.

DAMKUT (*Lat. 16° 34′ N., Long. 52° 49′ E.*), the only seaport in Ghubbet Kamar, is situated in a valley at the western extreme of Jebel Kamar on an irregular plain about a mile square, and bounded on all sides, except the sea, by almost inaccessible mountains.

A reef of rocks on which the sea breaks extends 1¼ cables from the shore; on the eastern side of this reef there is a good landing when the south-westerly swell is not very heavy, though at the same time the western side may be almost unapproachable. On the western side of the plain is a salt-water khor, with a few date trees round it, and on a cliff immediately over the town stands a ruinous fort.

The town consists of about 90 mud houses, with a population of about 400 people; and there is a large burial ground here. They have a small export trade in ghi, hides, and gums, and possess many small boats in which they are chiefly employed shark fishing during the fine season.

Mahra tribe.—This is the eastern limit of the coast-line of the Mahra tribe; between it and Ras Tarbat Ali, 14 miles eastward, the ground is said to be neutral and inhabited both by Mahra and Garra. This information is old and may possibly be incorrect.

The Mahra tribe, so frequently alluded to, is numerous and powerful, its territory extending along the whole coast from

Chart 10b, South-east coast of Arabia. Var. 0°30′ E.

Museinaa to Damkut. Their chief is the Sultan of Kishin, at which place he resides. They are an extremely bold and hardy race, but are crafty and not to be trusted.

From Damkut eastward, the bank of soundings becomes very narrow and steep, there being no bottom in some places at 1½ miles from the shore, and from 7 to 10 fathoms close to.

Jodab (*Lat. 16° 37′ N., Long. 52° 57′ E.*), a village built under some rocks, is 9 miles eastward of Damkut. About 2 miles farther on is Hauf, a village and tower, the residence of a sheikh. Ras Tarbat Ali is a small rocky point about 200 feet above the level of the sea, having over it a bluff on the high range 3,950 feet high, which is very conspicuous from the south-westward; from the south-eastward it is not so distinguishable against the high background.

From Ras Tarbat Ali eastward the coast is inhabited by the Garra tribe. Thalfut is a grove of date trees 10 miles eastward of Tarbat Ali. There are large numbers of cattle in this locality. Kharfut, a fertile valley, is 5 miles eastward of Thalfut.

Rakhuit is a village 11 miles westward of Ras Sakar in the Khais-bin-Umar valley, which valley produces limes and tamarinds. Khaisat-bin-Othman is a similar valley 4 miles farther eastward with a village named Safut at its entrance.

From Khaisat-bin-Othman to Ras Sakar, the mountains rise like a wall from the sea, and the bank of soundings does not extend more than one mile from the shore, falling off suddenly from 35 fathoms to no bottom at 120 fathoms. The whole range of mountains from Damkut is comprised under the general appellation of Jebel Kamar, and though sterile in appearance at a distance, they are clothed with wood from base to summit.

RAS SAKAR (Seger) (*Lat. 16° 44½′ N., Long. 53° 34′ E.*) is a high, steep, and rounded cape, rising in three steps from the sea, the highest of which is a perpendicular bluff 2,770 feet high; the summit of the cape is a level table land 3,380 feet above the sea. The eastern side of Ras Sakar is perpendicularly scarped, but is not so high as the south-western side on account of the strata dipping towards the east. The south-western side is not perpendicular, but descends in three or four grand steps to the sea, of which the ledges are so narrow that the summit may be seen only half a mile distant from the base. The bluff extreme of the cape is perpendicular to the water's edge; it is steep-to, there being no bottom at 100 fathoms within one mile of it.

General chart 1012.

Chart 10b, South-east coast of Arabia. Var. 0° 30′ E.

COAST.—Ghubbet Fazaiya.—From Ras Sakar to Ras al Himar, a distance of 24 miles, the coast is rocky and irregular, forming the slight curve named Ghubbet Fazaiya, in which the soundings are still somewhat deep, but the banks extend to a much greater distance seaward than off and westward of Ras Sakar, the 100-fathoms contour-line being 9 miles offshore: close inshore the depths are from 10 to 11 fathoms. Near the western end of the bay is a rocky islet near the shore, with deep water around it.

Ras al Himar, or Red cape, is a rocky bluff point formed of red irregular hills, projecting from the high mountain range which skirts the coast. On the summit of the bluff is a remarkable needle peak with a notch between it and a smaller peak.

Plan, Bander Reisut, on chart 10b.

RAS REISUT (*Lat. 16° 56′ N., Long. 54° 1′ E.*) is a bluff rocky point about 100 feet in height, 4 miles eastward of Ras al Himar, and is the southern point of Bander Reisut. On its extreme are the remains of a small round tower, and farther in, on the ridge, is an ancient burial ground of about three acres. Close eastward of the point are three rocky islets. Ras Reisut is the western boundary of the low land of Dhofar and is composed of the white and grey limestone of the coast, much scarped, and very irregular near its summit from denudation.

Bander Reisut is the small bay immediately northward of Ras Reisut, affording excellent shelter during south-westerly or westerly winds, with good anchorage in from 4 to 5 fathoms water. A white rock lies close to the shore one mile north-westward from the cape; the best anchorage is about midway between the rock and the cape in 3½ to 4 fathoms. Inshore of this line the water quickly shoals to 3 and 2 fathoms.

Water.—A well of indifferent water is said to exist half a mile from the beach in the southern part of the bay.

Chart 10b, South-east coast of Arabia.

COAST.—From Bander Reisut the coast again takes an easterly direction for 40 miles to Merbat bay. It is low and sandy until within 16 miles of Merbat, when cliffs about 100 feet in height again prevail. Off the low portion of the coast the depths are regular and extend some 13 miles offshore, there being 100 fathoms water at that distance.

Good anchorage may generally be found in from 5 to 7 fathoms at 7 or 8 cables from the beach.

General chart 1012.

Chart 10b, South-east coast of Arabia. Var. 0° 30′ E.

Aspect.—The coast is backed by Jebel Kamar and Jebel Samhan, a range of mountains from 3,000 to 4,000 feet high which skirts the coast and terminates at Ras Nus. The appearance of the coast from Reisut to Diriz, a distance of about 11 miles, is pleasing to the eye, presenting a succession of green fields, cocoanut groves, and buildings, with a high range of mountains in the background. Eastward of Diriz all traces of cultivation are lost, the ground being swampy and covered with mangroves for a distance of 14 miles, until the village of Thakis is reached.

Between Thaka and Merbat is a succession of limestone cliffs about 100 feet in height, the high range of Jebel Samhan sloping down to within one mile of their edge. The coast here is bold, there being 10 fathoms within half a mile of the cliffs.

The inhabitants for the most part dwell in natural caverns, some of which are of considerable size; and, as these are generally situated on the precipitous portions facing the sea, their positions may sometimes be distinguished when night comes on by their lights.

DHOFAR PLAIN (*Lat. 17° N., Long. 54° 10′ E.*).—The plain of Dhofar is bounded on the west by the high land of Ras al Himar, on the east by Jebel Samhan near the village of Thaka, and on the north by the curve of the hills. It is the largest of the lowland tracts that intervene between the sea and the mountains, and in the central part recedes 10 miles from the shore. It possesses a rich arable productive soil and a good supply of fresh water, and is one of the most fertile districts on the southern coast of Arabia.

The governor and his garrison of 200 men reside at Salala.

The towns of Dhofar are congregated about its centre, near the sea, probably for mutual protection. They are six in number, viz., Diriz, Robat, Salala, Al-Hafa, Abkad and Okkad, The first four are grouped around the ruins of an ancient city on the seashore, now called Al-Bilad. Robat is a little distance inland towards the mountains and has been deserted on account of the (formerly?) constant predatory visits of the Garra tribe. Okkad and Abkad are on the shore a few miles westward of Salala.

During the South-west monsoon, the wind, waves, and sand are said to render Dhofar so disagreeable that the principal inhabitants retreat to the mountains. After the rains the plain affords pasture for a large number of sheep and cattle.

In several parts of the plain there are ruined towns resembling Al-Bilad, described on the following page. They

are six in number, and are said to have been built by the Min Gui.

Produce.—Frankincense and gum-arabic trees abound on the mountain slopes in the interior, as well as many other medicinal gums, which might be collected in large quantities; but the trade is small, owing to the want of some safe place of exchange or sale.

Okkad (*Lat. 17° 0′ N., Long. 54° 2′ E.*) is a village with about 120 inhabitants, 4 miles northward of Ras Reisut and about half a mile from the beach; round it is a little cultivated ground and some cocoanut trees; near it is a salt-water lagoon. There are several wells of good water in the village.

Abkad, another small village, is one mile eastward of Okkad and half a mile from the beach, with about 80 inhabitants who possess some fishing-boats. There is a fresh water lake in the vicinity.

Salala, a town containing about 600 inhabitants, is nearly 3 miles from Abkad and 1¼ miles from the shore; it is surrounded by groves of cocoanut trees and cultivated ground, giving the coast a fresh green appearance from seaward; there is a white fort on the beach opposite the town. There are a lake and several wells of good water here.

Al-Hafa, a town nearly one mile south-eastward of Salala and close to the beach, contains about 600 inhabitants who possess a few fishing-boats; it is surrounded by groves of cocoanut trees and well-cultivated ground, and has several wells of good water.

Al-Bilad (*Lat. 17° 1′ N., Long. 54° 8′ E.*).—One mile eastward of Al-Hafa, and separated from it by richly cultivated ground, are the extensive ruins of Al-Bilad, close to the beach, spread over an area 2 miles in length by 600 yards in breadth; near, but eastward of it, is a deep khor of fresh water thickly covered with bulrushes. The site may be known by the high mound formed by the ruins at the eastern end of the large grove of cocoanut trees.

Water.—Good water may be obtained here, and at all the villages on the coast of Dhofar; but, owing to the surf which rolls in on the beach, it is dangerous for crews of vessels to fill their own casks in ships' boats; the natives will bring out the water in their fishing-boats.

Robat is a deserted town close to the northern edge of the khor, with a mosque, the walls of which are built of stone; on

Chart 10b, South-east coast of Arabia. Var. 0° 30′ E.

the pulpit is an inscription with the date of its erection, Ann. Hej. 1232, built by Abdul-Sheikh-bin-Taujah.

Diriz, a small town 4 miles eastward of Al-Hafa, and close to the beach, is, like that village, surrounded by cultivated ground and groves of cocoanut trees. Round the town are several watch-towers within range of each other, for its protection. A salt water khor lies immediately eastward of Diriz, and 2 miles beyond it are the ruins of a fort.

Thaka (*Lat. 17° 2′ N., Long. 54° 24′ E.*) is a small village built of mud and stones with a population of about 350; it is close to the shore, which here consists of limestone cliffs 100 feet in height at the foot of the mountains, which slope down to within one mile of the shore. Westward of the village are groves of cocoanut trees and some cultivated ground. There are two fresh water khors, and one (Khor Reiri) salt; the latter is probably fresh at its upper part, but near the coast it is very brackish and it has a perceptible tidal rise and fall; it is separated from the sea by a narrow ridge of sand, and it is said that formerly boats could enter it.

Supplies.—Good water and bullocks are to be obtained here.

Plan, Merbat bay, on chart 10b. Var. 0° 40′ E.

MERBAT BAY is on the northern side of Ras Merbat and affords complete shelter from all winds but those between South and West, and good anchorage in from 7 to 9 fathoms, with Ras Merbat, bearing S. ½ W., distant about 7 cables.

Jebel Doa-an, presently described, bearing N. by E. or eastward of that bearing, is a good mark for identifying Merbat; as is also a sugar-loaf peak near the eastern extreme of the range of which Jebel Doa-an is the western summit. This sugar-loaf is not so high as the rest of the range, but in approaching from the westward, if kept bearing N.E. by E., it leads to the anchorage. The eastern shore of the bay is the beginning of an extensive sandy plain, lying between the mountains and the shore, on which appear a few hills of moderate height.

Ras Merbat (*Lat. 16° 58′ N., Long. 54° 42′ E.*), a low rocky point, is the south-western extreme of the low belt of land extending from Jebel Samhan to the sea.

A reef extends westward 2 cables from the point, with from 8 to 10 fathoms water close to its edge and 20 fathoms 2 cables from it.

At about 3 cables east-south-eastward from Ras Merbat is the tomb of Sheikh Aidrus, in ruins.

General chart 1012.

Plan, Merbat bay, on chart 10b. Vab. 0° 30′ E.

Merbat village is near the centre of the bay, close to the beach, and about three quarters of a mile northward of the cape; it consists of mud and stone houses with a population of about 300, who are friendly and subject to the Sultan of Maskat, who maintains a small garrison here. Northward of the town is a tomb. Around the houses are ruins of others of a more ancient date, from which the newer ones appear to have been constructed. This is commonly the case with the villages on this coast.

Trade.—Merbat is the principal trading town of the province of Dhofar; the exports are frankincense and gum-arabic, which latter is collected from the Bedouins and varies much in quantity. The trade was, and probably is, mostly carried on by barter, they receiving rice, dates, cotton, cloths, &c., in exchange for their gums. The sheikh levies a duty on all exports and imports.

Landing is impossible here in the South-west monsoon.

Supplies.—Very indifferent brackish water, firewood, and a few bullocks and goats may be obtained here. Merbat is a common place for local coasting vessels to water at, although the water is so brackish that it is hardly drinkable by those who have been accustomed to better. About 4 miles westward of Merbat there is a mountain rivulet of excellent water, at which, descending as it does to within a few hundred yards of the shore, vessels are enabled to replenish their tanks.

Tides.—It is high water, full and change, at Merbat at 9h.; springs rise 7 feet.

Jebel Doa-an or Merbat peak (*Lat. 17° 5′ N., Long. 54° 42′ E.*), 3,690 feet in height, is the western brow of the high limestone range of Jebel Samhan, which, as before mentioned, skirts the shore between Ghubbet Kamar and Ras Nus and closely approaches Merbat bay, its seaward slopes terminating abruptly in cliffs. Jebel Doa-an is the best landmark for making Merbat, as above mentioned; the peak is nothing more than an elevated part of the mountains, from which they rapidly decline in height to the westward, thus rendering it a conspicuous object from the sea.

Chart 10b, South-east coast of Arabia.

COAST.—From Ras Merbat eastward to Jebel Jenjeli, a distance of about 20 miles, the coast is low, rocky, and irregular, with several small sandy bays, rocky points, and isolated rocks close to them. It is backed by the high mountain range of Jebel Samhan; *see* view on chart 10*b*. The

Chart 10b, South-east coast of Arabia. Var. 0° 30′ E.

water is very deep, there being depths of 30 and 40 fathoms about a cable's length offshore, and 100 fathoms within a quarter of a mile.

Bander Jenjeli (*Lat. 17° 0′ N., Long. 55° 3′ E.*) is a sandy bay immediately under the high conical hill bearing that name. It is 2¼ miles wide at the entrance and reaches eastward 1¼ miles, affording shelter from easterly and north-easterly winds, but open to the southward and south-westward. This bay has irregular depths varying from 8 to 12 and 16 fathoms, with overfalls; the bottom is rock and sand. In the centre, on a line drawn from point to point, there is a depth of 26 fathoms, with deeper water immediately outside that line.

Jebel Jenjeli is a remarkable conical hill 1,300 feet high and close to the sea; it is composed of limestone traversed by veins of chalk and gypsum.

From Jebel Jenjeli the coast takes a more northerly trend, and at 15 miles north-eastward of it is Jebel Musaira, of similar formation, with a rocky irregular coast between them; 6 miles farther, immediately over Ras Nus, is Jebel Nus, presently described. Between Jebel Musaira and Jebel Nus is a valley with some brushwood; with this exception, the same rocky irregular outline of the coast extends to Ras Nus, with deep water close to the shore the whole distance.

The belt of low land between the mountains and the sea from Merbat to Ras Nus, a distance of about 36 miles, is named Sellha. The whole is extremely desolate, there being no visible sign of vegetation, yet antelopes and hares manage to find a little herbage in the hollows of the watercourses, Near Ras Nus is a ravine, with some date trees, through which runs a stream after heavy rains.

Chart 11, Khorya Morya bay and islands.

Ras Nus (*Lat. 17° 15′ N., Long. 55° 18′ E.*).—This low but prominent rocky cape forms the south-western extreme of Khorya Morya bay, and the south-eastern point of the small boat anchorage presently described, and named after it. Ras Nus may be easily known by Jebel Nus, the eastern termination of Jebel Samhan range, 1,200 feet in height, immediately over it. Jebel Nus is wedge-shaped, with the highest and most precipitous part nearest the sea, something like a bluff. Immediately south-westward of Ras Nus is a large mass of rock near the shore, shaped like a tub.

Bander Nus is the small boat anchorage between Ras Nus and Ras Samhar, affording shelter from southerly and westerly winds. The anchorage is close to the shore, there being 9 fathoms water at about 2½ cables off.

General chart 1012.

Chart 11, Khorya Morya bay and islands. Var. 0° 40′ E.

Ras Samhar is the low rocky northern point of Bander Nus, with a reef off it and two small rocks a few yards distant. In a small valley between Ras Samhar and Ras Hullan, 2½ miles farther northward and about one mile from the sea, is the tomb of Nebi Saleh-bin-Hud; it was about 50 feet in length and nearly the same breadth, but the whole is now a heap of ruins.

Water.—Close to the anchorage in Bander Nus is a spring of good water, sufficiently abundant to supply two or three small vessels in one day; its position may be known by a date grove near it. Also in Wadi Samha, a small and wooded valley to the northward between Ras Hullan and Ras Samha, is a spring of fresh and a pool of brackish water, near the sea; also, just northward of Ras Samha fresh water may be obtained and firewood cut from any of the ravines in the neighbourhood.

KHORYA MORYA ISLANDS. — These islands are five in number, namely, Haski, Soda, Hallaniya, Kabliya, and Kirzwet. The first four are close to the edge of the bank of soundings, and lie in line nearly east and west and parallel with the northern shore of Khorya Morya bay, from which the principal islands are distant about 22 miles. They are generally bold and rocky, rising in regular conical peaks; *see* views on chart 11.

They belong to the British Government, having been ceded by the Imaum of Maskat in 1854. They are uninhabited and desolate.

Haski, the westernmost island of the group, lies 15 miles eastward of Ras Hasik, and is 1¼ miles in a north-north-easterly direction in length by three quarters of a mile in breadth; its southern end rises in two conical peaks close together, attaining a height of 500 feet.

The island is of granite, without a vestige of vegetation or any appearance of ever having been inhabited. The surface is white from guano deposit.

Shoal.—The island is rocky all round, with two small bays on its eastern side. Half a mile S.W. by W. ½ W. from the north-western point is a shoal about a quarter of a mile in extent, with a rock, dry at low water; between it and the island is a depth of 16 fathoms.

The average depths at one mile from the island from east to west round by north are from 25 to 30 fathoms; but the edge of the bank of soundings passes near the southern end, there being no bottom at 145 fathoms, only 5 cables from that point.

General charts 10b and 1012.

Chart 11, Khorya Morya bay and islands. Var. 0° 40′ E.

The channel between Haski and Soda is safe, with the exception of the sunken rock off the western side of Soda.

Soda (*Lat. 17° 28′ N., Long. 55° 51′ E.*) is the second island of the group from the westward and the second largest in size, being 3 miles in length east and west by 1½ miles in breadth and lies about 12½ miles eastward of Haski. Its shores have many small projecting points, off which reefs extend from half to 1½ cables, forming coves suitable for small craft. The eastern end is fronted by sunken rocks.

The outline of the island is an irregular slope from the highest peak, which is near the centre and 1,310 feet above sea level.

The whole island is extremely barren, having no trees but tamarisks, and only a small quantity of grass and moss near the summit of the peak. It was inhabited many years since, and the remains of rude dwellings are still visible near a well of brackish water close to the south-eastern point.

Rock.—About 7 cables west from the western point of the island is a sunken rock surrounded by a bank upwards of half a mile in extent, with 2 and 3 fathoms water, between which and the shore are depths of 5 to 6 fathoms.

Anchorage.—On the southern side of the island there is a bay half a mile in extent with good anchorage, having 10 fathoms water in the centre, the depth decreasing as the shore is approached.

A ledge of rocks extends about 3 cables from the eastern point of the bay in a south-westerly direction, and there is a sunken rock at a short distance from the western point. This bay affords shelter from all winds, except those from W.S.W. to South.

Depths.—The water around Soda is deep, as charted; the bottom is sand and rocks on the eastern and western sides of the island; sand, shells, and coral on its northern side; and grey sand on its north-western side.

If passing between Hallaniya and Soda, keep near Soda island side, which may be safely approached to within half a mile, to avoid the rocks lying off the western end of Hallaniya, which reduce the width of the channel to 2½ miles. There are depths from 6½ to 12 and 20 fathoms in mid-channel.

Hallaniya, the largest island of the group, is 7½ miles in length east and west by 4¼ miles in breadth, and lies 4½ miles eastward of Soda. The general appearance of the island is rugged, the central part having numerous granite peaks, of

Chart 11, Khorya Morya bay and islands. Var. 0° 40 E.

which the highest is 1,503 feet above the sea, forming chimney peaks closely united, and terminating at the eastern and western ends of the island in comparatively low points. The mountains end at the northern point of the island in Ras Hallaniya, a bold, projecting limestone bluff, 1,645 feet in height, the loftiest part of the island, and presenting a rugged and nearly perpendicular cliff to the sea for upwards of a mile on each side of the point; *see* view on chart 11. The whole island is extremely barren, the only description of tree being the tamarisk; there is a little grass on the eastern side.

It was formerly said to be the only inhabited island of the group, a few miserably poor people living in huts on the north-western side, but when visited by the R.I.M.S. *Minto* in 1901 it was found that even these people had left and the island was, like the rest of the group, without an inhabitant.

Reefs (*Lat. 17° 30′ N., Long. 55° 57′ E.*).—There are several shoals and isolated rocks off Erekhi Frahunt, the western end of Hallaniya, and between them are depths of from 5 to 10 fathoms. One of these rocks, three quarters of a mile from the point, dries at low water, springs; the westernmost patch is $1\frac{3}{4}$ miles from the point.

Off Ras Saiir, the eastern point of the island, and for $2\frac{1}{2}$ miles south-westward of it, the coast is fronted by a reef extending from 5 to 8 cables from the shore. About 4 cables S. by E. from the southern point of the island is a $3\frac{1}{2}$-fathoms patch, and in the bay westward of the point is a reef of rocks close to the shore.

Anchorages.—The best anchorage at Hallaniya is in from 8 to 12 fathoms, sand, on the northern side, at about one mile from the western extreme, and a quarter of a mile off a small sandy nook, but it is open to all winds from east through north to west. Sailing vessels anchoring here in the North-east monsoon must, therefore, be prepared to weigh at a moment's warning, the Belats, or northerly winds, setting in suddenly, when the coast of the island becomes a dead lee shore.

There is also good anchorage in Ghubbet Ar-rahib on the north-eastern side of the island, in from 7 to 14 fathoms water, with shelter from all winds from S.E. through south to N.W. During the strength of the South-west monsoon, heavy south-westerly squalls come down the gully between the hills, and a considerable sea sets into this bay, at which time the western anchorage is preferable.

Water.—Fresh water may be obtained in Ghubbet Ar-rahib from a well 2 cables from a nook with a sandy beach; its position may be seen on the chart. There are or were two other wells

Chart 11, Khorya Morya bay and islands. Var. 0° 40′ E.

towards the western end of the island, one near the western anchorage on the northern shore, the other on the southern side.

Kabliya (*Lat. 17° 30′ N., Long. 56° 19′ E.*), the eastern island and the third largest of the group, is nearly 2 miles in length by one mile in width, and shows from every point of view several limestone peaks, of which the highest is 550 feet above the sea; *see* view on chart 11. It is barren and rocky all round, with the exception of a small sandy bay at the north-western point.

The channel between Hallaniya and Kabliya is about 12 miles wide, with depths of from 20 to 46 fathoms and is apparently free from danger.

Four-peaked rock, so named from its outline, lies 6 cables west-north-westward from the northern point of Kabliya, with a rocky channel between them of from 2 to 3 fathoms. It is about 100 feet in height and has a rocky ledge extending half a mile north-westward from it, on which are four rocks above water; parts of the reef dry at low water, springs.

Well rock is so called from its having a natural well filled with salt water, which is probably thrown into it by the South-west monsoon. It lies 4 cables off the south-western point of Kabliya, with depths of from 7 to 10 fathoms between.

Tilly rock, with 3 fathoms water, lies E. by S., rather more than one mile from the eastern extreme of Kabliya.

A small rock, dry at low water springs, and which usually breaks, lies 2¼ miles eastward of Tilly rock, with the eastern point of Kabliya bearing W. ¾ N. 3½ miles.

Four-peaked rock, well open northward of the island, leads northward of it. Vessels should be careful if rounding the eastern end of Kabliya island at night to give these rocks a wide berth, as they are steep-to and the depths around are irregular.

Anchorages.—There is indifferent holding ground requiring a long scope of cable on the northern side of Kabliya, the bottom being loose and decayed coral; on the southern side also there is anchorage in about 12 fathoms, similar bottom, with Well rock bearing W.S.W. and the western extreme of the island W.N.W. There is no water on the island.

Kirzwet, or Rodondo (*Lat. 17° 36′ N., Long. 56° 7′ E.*), is a mere rock with a double peak, of which the highest is 230 feet above the sea; the base of the island consists of four red granite rocks closely grouped together. It lies 6 miles north-eastward

Chart 11, Khorya Morya bay and islands. Var. 0° 40′ E.

of Hallaniya, and there are depths of from 25 to 30 fathoms between the two islands.

A sunken rock lies about 1½ cables north-westward of Kirzwet, and another near it, but only three-quarters of a cable from the island, with depths between them of from 8 to 16 fathoms. Close off the eastern point of the island are two rocks above water.

Tides.—It is high water, full and change, in Khorya Morya bay and amongst the islands at 8h. 20m.; springs rise 6½ feet. Southward of the islands the flood tide sets eastward; northward of them it sets westward.

Chart 10b, South-east coast of Arabia.

Current.—Between Ras Farták and Ras Nus, the current often runs against the wind during the North-east monsoon. Amongst the Khorya Morya islands it varies very much, and frequently sets north-westward, rendering it unsafe for a sailing vessel to get becalmed near the islands; it is advisable, therefore, for such vessels to pass well southward of them, unless at a time when land and sea breezes prevail, when they may make progress against the monsoon by keeping close inshore.

KHORYA MORYA BAY is deep bight in the coast between Ras Hasik and Ras Sharbitat, 65 miles apart in an east-north-east and opposite direction. The five Khorya Morya islands lie in the approach to this bay from the southward and westward as above described.

Within the line of the islands the depths in the bay are fairly regular, varying between 20 and 45 fathoms, and decreasing both towards the shore and the islands; the bottom is generally sand, coral, and shells, but is occasionally rocky near the islands and also near the Ras Sharbitat. On the western side of the bay, until within Ras Hasik, the water is very deep, there being no bottom at 100 fathoms close to the shore, and half way between Ras Nus and Haski island a depth of 1,250 fathoms has been obtained.

The shore of the bay is a succession of limestone cliffs and sandy beaches; *see* views on charts 10*b* and 11. There are no villages, the few inhabitants living either in excavations or in natural caves in the rocks and subsisting almost entirely on fish.

Weather.—During the prevalence of Belats, the strong northerly winds which are experienced in Khorya Morya bay,

Chart 11, Khorya Morya bay and islands. Var. 0° 40′ E.

and westward of Merbat, a strong south-easterly wind will be found blowing over Merbat during the day, and light variable airs during the night, *see* page 16. Rain seldom falls at Merbat, but farther westward the mountains and plain of Dhofar experience an abundance of rain at times during the South-west monsoon.

Ras Hasik (*Lat. 17° 23′ N., Long. 55° 20′ E.*), a low projecting rocky point 8½ miles northward of Ras Nus, is the southern point of Ghubbet al Dom.

The coast here presents a very striking scene; the unbroken face of the limestone mountains with the sharp peaks of the granite ranges (one of which, Jebel Habrut, attains a height of 4,000 feet) are very grand; yet it has a most barren appearance from the sea, not a particle of vegetation being perceptible to the eye. On shore, however, the valleys are found to be well wooded, having generally either wells or a rivulet of fresh water; *see* view on chart 10*b*.

Bander Hasik is a small bay on the north-western side of Ras Hasik, affording shelter from southerly winds. The bank of soundings does not extend any great distance offshore, there being no bottom at 130 fathoms 2½ cables from the point. Close to the shore the depths are from 5 to 12 fathoms.

In a valley at a short distance from the head of the bay are the ruins of the ancient town of Hasik, and a well of brackish water. The natives found here were living almost entirely on fish, many of them being without clothing. Immediately southward of Ras Hasik is a plain called Suk Hasik, from its having been the market-place when Hasik flourished, off which there is shelter for two or three boats from northerly winds.

An inlet of the sea (the bed of which is now a marsh, separated from the sea by a ridge of sand) once existed in the valley of Hasik, and in all probability formed the ancient port, as its waters would almost wash the base of the old ruined town. A few stunted date trees are scattered over its surface and the bed of the valley higher up is densely filled with acacias, tamarisks, and other small trees. The slopes of the mountains produce frankincense, which is collected by Bedouins in small quantities in the proper season.

Soundings.—Between Merbat and Ras Hasik, the 100-fathoms contour line of soundings approaches in some places to within half a mile of the shore, and in others is at 2 and 2½ miles. Sailing vessels, therefore, should keep a good offing, as, in the event of being becalmed, there is no anchorage.

General charts 10b and 1012.

Chart 11, Khorya Morya bay and islands. Var. 0° 40′ E.

Ghubbet al Dom, on the western side of Khorya Morya bay, lies between Ras Hasik and Ras Muntajib, which are about 17 miles apart. The coast between Ras Hasik and Ras Tihrar, a low sandy point, is irregular; from thence round the bay (with the exception of a sandy spot just northward of Ras Attabarran and 7 miles northward of Ras Tihrar, fronting a valley where there is a pool of fresh water), it is high precipitous table land, with three conspicuous valleys. The depths in this bay are regular, but it has not been closely sounded; the 10-fathoms contour-line is nearly one mile, and the 20-fathoms line 3 miles offshore, but it is not much deeper to the north-eastward.

Wadi Reikut (*Lat. 17° 24′ N., Long. 55° 19′ E.*), fronted by a sandy cove, at the southern part of Gubbet al Dom is said to extend to the confines of Hadramaut, having the peak of Habrut and the Samhan range of mountains as its southern boundary. It appears to be thickly wooded and well watered; the breadth of the watercourse, and the huge masses of rock that have been swept down it, fully denote a strong torrent after a heavy fall of rain. At the entrance to the valley are a spring of fresh and a lake of brackish water.

Ras Muntajib (*Lat. 17° 39′ N., Long. 55° 24′ E.*) is a bluff headland, with rugged peak at the north extreme of Ghubbet al Dom.

From Ras Muntajib the shore of the bay trends north-north-eastward for 7 miles, and then more easterly for 16 miles to the high and dark point of Shuwamiya. At the end of the first 7 miles, the steep cliffs terminate and the high land recedes from the shore 2 or 3 miles, and, after continuing in a line parallel with the beach, again approaches the sea at the dark point of Shuwamiya above mentioned, and which must not be confused with Ras Shuwamiya a few miles farther eastward. The shore and plain fronting the mountains are low and sandy, with some bushes; there is a sandhill at the western extreme of the plain, and a clump of trees at the eastern extreme.

From the dark point of Shuwamiya, the coast again assumes a bold character, consisting of steep cliffs and a table land from 400 to 600 feet in height, which trends in an unbroken line for 25 miles, or to within 11 miles of Ras Sharbitat.

Ras Shuwamiya is a point 10 miles eastward of the dark point of Shuwamiya. The coast is bold, having 12 and 15 fathoms water within 2½ cables of the shore.

Ras Minji, a slightly projecting bluff nearly 700 feet high, is 10½ miles eastward of Ras Shuwamiya, with a pool of fresh water near the sea close eastward of it.

General charts 11 and 1012.

Chart 11, Khorya Morya bay and islands. Var. 0° 40′ E.

Between Ras Shuwamiya and Ras Minji, the depths are from 30 to 33 fathoms at half a mile offshore, with overfalls.

About 2 miles eastward of Ras Minji the cliffs are 700 feet high, from thence decreasing eastward, where they terminate one mile inland. Between this point and Ras Karwao the shore is low and sandy for 7 miles, resuming its cliffy character about 2 miles westward of that point.

Ras Karwao is a bluff table-topped headland about 800 feet in height, with steep precipitous sides. Its component parts are a species of sandstone lying over a horizontal stratum of chalk from 25 to 30 feet in thickness, with masses of flint and fossil remains embedded in it, while the sandstone varies in thickness from 5 to 10 feet. In some places between the two strata are enclosed beds of shells, coral, and other marine productions. The summit appears to be of tertiary limestone, with fossil remains.

Westward of Ras Karwao is a sandhill, and the cliffs here are fronted by a strip of low land with off-lying rocks. At the western extreme of the low land is a small salt-water lake, at the head of which the water is fresh.

RAS SHARBITAT (*Lat. 17° 53′ N., Long. 56° 20′ E.*).—Ras Sharbitat, 2 miles eastward of Ras Karwao, is the eastern point of Khorya Morya bay; it is a precipitous bluff with an even table surface and a deep notch or concavity in its face; *see* view on chart 11.

Anchorage.—Native boats, running down the coast, frequently anchor for shelter from the Belats or northerly winds off the low sandy shore westward of Ras Karwao, known as Bander Sharbitat. There is good anchoring ground all along here in 5 to 10 fathoms. The bottom is sand in the anchorage depths, but outside it becomes mixed with rock.

During the Belats, which blow with great violence in this bay, a sailing vessel from the eastward should round Ras Karwao very closely and be prepared for strong gusts, both in rounding and making towards the anchorage off the small salt-water lake described.

General charts 10b and 1012.

CHAPTER XII.

ARABIAN COAST.

RAS SHARBITAT TO RAS AL-HADD.

(From Lat. 17° 53′ N., Long. 56° 20° E., to Lat. 22° 33′ N., Long. 60° 5′ E.)

VARIATION IN 1909.—Increasing 2′ annually.

COAST.—From Ras Sharbitat, the coast trends north-eastward for 21 miles to Ras Sukra, presenting a noble limestone cliff about 600 feet in height, precipitous to the water's edge, and with level table land at its summit. The shore is quite bold, there being 20 fathoms close to the cliff. The soundings along this part of the coast are regular. At from 21 to 29 miles eastward of Ras Sukra, is a coral bank with depths of 21 to 29 fathoms. The 100-fathoms line of soundings is about 37 miles off Ras Sukra, and 7 or 8 miles outside this coral bank.

Chart 10c, North-east coast of Arabia.

Ras Sukra *(Lat. 18° 8′ N., Long. 56° 35′ E.)* is a prominent bluff cape rising 600 feet above the sea, and is the south-western extreme of Sukra bay. From the north-eastward it appears a perfect bluff; about 24 miles northward of it and 10 miles inland is Funnel or Tower hill, which, when first sighted, appears separated, but on a nearer approach is found to be on the summit of the adjacent high tableland, which from Ras Sukra gradually recedes from the shore. When the sun shines on it, the whole coast-line has the appearance of clay cliffs. From Funnel hill, the tableland takes a more easterly direction, and gradually approaches the shore again towards the eastern extreme of the bay.

SUKRA BAY.—From Ras Sukra the coast trends northward for about 35 miles, and then gradually curves away eastward, nearly 60 miles to Ras Khishayim, which bears from Ras Sukra N.E. ¾ E. 80 miles, the shore receding about 22 miles from that line and thus forming the bay of Sukra. The shore is low and sandy throughout, and thinly sprinkled with mangrove bushes, but 5 to 10 miles inland is the range of moderately high tablehills before mentioned. During the

Takiyat Alak. *N. 37 W.* Ras Madraka. *N. 39 E.*

Chart 10c, North-east coast of Arabia. Var. 0° 50′ E.

North-east monsoon there is always a heavy swell rolling into the bay and a high surf on the beach.

There are no villages in this bay, and it is but scantily inhabited.

Depths.—The depths in Sukra bay are from 6 to 12 fathoms near its south-western extreme, but deeper and more regular at its north-eastern end. For a distance of 45 miles northward from Ras Sukra the bay is shallow (generally under 5 fathoms) from 5 to 7 miles from the shore, and over this portion there is usually a strong ripple, from whence it has derived the name of Rig-al-Jazir: but there appears to be no danger except close in eastward of Funnel hill, where a rocky bank, nearly dry at low water, extends two miles or more from the beach. Towards the eastern extreme of the bay the shore is safe to approach, the 10-fathoms line being about 2 miles off.

Ras Khishayim is a dark slightly projecting perpendicular bluff terminating a range of flat-topped hills at the north-eastern extreme of Sukra bay and about 8 miles westward from Ras Madraka.

Takiyat Abak (Abak's cap), so named from its supposed resemblance to a man's head-dress, is a bluff point 333 feet above the sea, about half way between Ras Khishayim and Ras Madraka.

Bander Jezírat is a small bay with a sandy beach, eastward of the cliffs of Ras Khishayim. In this bay the bottom is mud and sand, and a vessel may anchor in any part of it. Should the wind shift to the south-westward and blow hard, which is not at all unfrequent during the North-east monsoon, a vessel should shift her anchorage to the northern side of Ras Madraka. Trading craft from the northward often anchor here for the purpose of procuring sharks' fins.

Plan, Madraka anchorage, on chart 10c.

RAS MADRAKA (*Lat. 19° 0′ N., Long. 57° 51′ E.*) is a dark point with a rocky islet about half a mile long and 60 feet high off it, and separated from it by a narrow channel with only a depth of 2 feet at low water. Ras Madraka is the south-western point of the gulf of Masíra; the land about it consists of black volcanic peaks, with flat-topped hills of on average height of 450 feet in the background. Copper ore of poor quality is found in the vicinity.

When approached from seaward, the point appears like an island, hence it is sometimes called Ras al Jezírat or Isolette.

General chart 1012.

Plan, Madraka anchorage, on chart 10c. Var. 0° 50′ E.

On being first seen, it presents the appearance of small detached hillocks, but on a nearer approach the peaks become connected, and Look-out hill, a remarkable circular hummock, is observed on the summit of the point.

Ras Madraka is bold, there being 12 fathoms within half a mile of the shore and the 100-fathoms line is distant about 10 miles from it.

Anchorage.—A good berth in about 5¼ fathoms, during the South-west monsoon, northward of Ras Madraka, is with the eastern extreme of the islet bearing south about 7 cables, or in about the same depth for about half a mile anywhere on a line drawn about S. by E. from the berth indicated. Small vessels might anchor closer in, but a long swell sets in here. This is a good place at which to await slave dhows, which leave the Zanzibar coast for the Persian gulf early in the South-west monsoon. No supplies are obtainable from the natives, who avoid intercourse with Europeans, but an abundance of fish may be taken in the seine.

Chart 10c, North-east coast of Arabia.

GULF OF MASÍRA.—The Gulf of Masíra is the extensive bight included between Ras Madraka and Masíra island. The whole coast of the gulf is desolate, and but thinly inhabited by small parties of the Jeneba tribe, who subsist almost entirely on fish.

Caution.—A near approach to the Gulf of Mesíra should be avoided by vessels passing up or down the coast, owing to the many dangerous coral patches and banks within its limits; and also on account of the indraught which at times exists near and within the shoals, especially on the flood stream, which runs between north-north-west and north-west at 1½ miles an hour; the ebb running at the same rate in the opposite direction. Beyond the limits of the bank of soundings, the tidal set is parallel with the shore, but is probably lost in the prevailing current. As there is ample room for soundings being taken between the outer reefs and the edge of the bank of soundings, a distance of from 10 to 15 miles, common attention to the lead should prevent any vessel running into danger. During strong winds there is always a heavy swell rolling in, and on many parts of the numerous banks the sea breaks heavily.

Fogs.—Thick fogs are prevalent in the vicinity of Ghubbet Hashish and the Gulf of Masíra during the North-east monsoon, which are borne down with rapidity by a sudden impulse of wind from the northward.

General chart 1012.

Chart 10c, North-east coast of Arabia. Var. 1° 0′ E.

Shoals.—Shab Kudún, or San Carlos banks, are several coral patches off the coast between Ras Markaz and Ras Kuweirát, and extend about 20 miles in a north-east and south-west direction. The south-western patch is 4 miles long, its western extreme lies E. by S. 5 miles from Ras al Aani. From the central bank, on which the *San Carlos* struck, Ras Kuweirát bears N.W. about 19 miles.

The soundings on these two banks are from 4 to 9 fathoms, and there would appear to be depths of 6 feet or less near their edges; considerable swell rolls over the shallow parts, and in a heavy sea would probably break. Between the banks the depths are from 12 to 14 fathoms, sand and shells, and between the south-western extreme and the land from 16 to 19 fathoms, sand and shells.

The north-eastern bank is about 8 miles long and its southern end is 4 miles south-eastward of the central patch; at this end it would appear to have a rocky rim with 6 feet water or less in many places, the rest of the bank has from 8 to 13 fathoms.

These banks should not be approached from the seaward side to a less depth than 20 fathoms; the safer depth near the central bank is 22 fathoms.

Shab Bu-Saifa.—*South extreme, Lat. 19° 49′ N., Long. 58° 12′ E.*) This coral bank is nearly 12 miles long, with an average breadth of 5 miles, and tapers to the southward. It has from 6 to 10 fathoms water over it from 16 to 20 fathoms on its eastern edge, and from 15 to 17 fathoms on its western edge.

From the southern point of the bank, Jezírat Hamar an-Nafur bears W. ½ S. about 23 miles.

Shab Ghubab (*Lat. 20° 12′ N., Long 57° 58′ E.*) is a breaking patch 5 cables half a mile long north and south, with from 3 to 7 fathoms close around. It lies 7 miles from the shore of Ghubbet Saráb, with Ras Bintót bearing North 7½ miles.

At 4 miles westward of Shab Ghubab is a rocky bank with from 2½ to 3 fathoms. About 2 miles in a south-south-westerly direction from Shab Ghubab is a bank with 5½ fathoms, and at 6 miles S. by W. from the same Shab is the northern extreme of a reef 4 miles long. Midway between Shab Ghubab and Shab Bu-Saifa, also, is a reef about 3½ miles long north-east and south-west.

From the western side of Shab Bu-Saifa northward to Kinasat Hikman, and to Masíra island, the general depths are

Chart 10c, North-east coast of Arabia. Var. 1° E.

from 7 to 10 fathoms, sand and coral, with occasional overfalls. From the same side of the shoal westward the depths are from 13 to 17 fathoms, mud, decreasing to 9 fathoms off Ras Bintót. There are a few detached coral patches with from 7 to 10 fathoms, but no known dangers except those just described.

Kinasat Hikmán is the extensive reef which begins at Ras Shijarét, from thence stretching away to 6 or 7 miles south-westward and southward of Ras Zeiwari, with foul ground of 3 fathoms and less, and extending for 7 miles offshore nearly as far as Ras Mishsiýu. It consists of dangerous coral patches, of which some dry at low water; the low land of Bar-al-Hikmán is only just visible from the extreme edge of this foul ground.

Shab Iziyat, a patch of rocks covered at high water, lies 1¾ miles south-eastward of Ras Abana, with a clear channel between of from 5 to 7 fathoms, rocky ground, the deepest water being close to the shoal.

A small rocky 3-fathoms bank lies nearly 2 miles south-westward from Shab Iziyat.

A rock with less than 6 feet of water over it is situated about 5½ miles north-north-eastward of Shab Iziyat, near the head of Ghubbet Hashish.

Between Shab Bu-Saifa and Shab Kudún the depths are from 26 to 27 fathoms near Bu-Saifa to from 14 to 17 fathoms, sand and shells, for the remaining distance; and between Shab Bu-Saifa and Jezírat Hamar-an-Nafur, they vary from 8 or 9 fathoms near that islet to 12 and 20 fathoms, mostly mud.

Tides.—It is high water, full and change, at the outer shoals at 9h. 30m.; springs rise 10 feet; the set is as before mentioned, when not affected by current.

COAST.—From Ras Madraka the shore of the Gulf of Masíra trends northward for 10 miles to Ras Markaz; it is sandy, with hills immediately behind, until within 2 miles of the latter point, when it assumes a bold precipitous character. Fram Ras Madraka, for a distance of 3½ miles, it is fronted by a narrow sandbank which dries at low water. Immediately inland, there is flat tableland from 460 to 480 feet above the level of the sea.

Ras Al-Dthila (*Lat. 19° 6′ N., Long. 57° 48′ E.*), a small projecting rocky point 5 miles northward of Ras Madraka, is the commencement of an uniform line of tableland extending as far north as Ras Kuweirát, descending to the sea in

Chart 10c, North-east coast of Arabia. Var. 1° E.

perpendicular cliffs, and varying in height from 230 to 480 feet. The land at Ras Al-Dthila is 470 feet above the sea.

Water.—Fresh water may be procured in small quantities at this point, and the fishermen will take it to a vessel at a reasonable price.

Ras Markaz is a bold projecting bluff point, and the highest part of the tableland, it being 480 feet above the sea. There are 6 fathoms water within 1½ cables of the point.

The bank of soundings extends 10 miles off Ras Madraka, increasing to 20 miles eastward of Ras Markaz, and it is free from dangers until the San Carlos banks previously described, are approached. The bottom is chiefly sand and shells.

Ras Khaisat al Liyókh.—From Ras Markaz the shore curves to the north-westward for about 4 miles to Ras Khaisat al Liyókh—a bluff difficult to make out unless close inshore—forming a small bay with a sandy beach, from which the lofty cliffs recede nearly three quarters of a mile.

Anchorage.—The bay affords good shelter from southerly and south-westerly winds, with safe anchorage in from 6 to 7 fathoms, sand.

From Ras Khaisat al Liyokh to Ras al Aani, a distance of 14 miles in a northerly direction, the coast presents an uninterrupted line of bold perpendicular cliffs and is safe to approach, there being from 3 to 4 fathoms close in, and 10 fathoms within half a mile.

Ras al Aani is a bluff point 280 feet above the sea, from which the coast runs north-north-westward 5 miles to Ras Mattah, a bluff projecting point 230 feet high, and then northward 9½ miles to Ras Kuweirát; for the first 5 miles the cliffs are fronted by a sandy beach.

Ras Kuweirát (*Lat. 19° 39′ N., Long. 57° 43′ E.*), a sharp projecting bluff with a small peak 250 feet high on its extreme, is the northern termination of the bold perpendicular cliffs just described.

Ghubbet Kuweirát is the bay between Ras Kuweirát and Ras Sireir, a low rocky point with two small rocky islets close off it; the shore of the bay is a sandy desolate plain, thinly covered with mangrove bushes. It is free from danger, having depths of from 3 to 6 fathoms, sand and coral, at 1½ and 3 miles respectively from the beach.

General chart 1012.

Chart 10c, North-east coast of Arabia. Var. 1° E.

Boat anchorage.—Close under Ras Kuweirát is an anchorage sheltered from south-westerly winds, but available for boats only, the water being shallow.

Jezírat Hamar-an-Nafur, about 3 miles eastward of Sireir, is a perpendicular limestone islet, 2½ cables in diameter and 320 feet high; its summit is flat and split in all directions. Myriads of sea birds frequent it, and the accumulation of guano is useful to the Arabs for agricultural purposes. Close to, both on the eastern and western sides, are some sunken rocks.

The channel between the island and the mainland is free from danger, with depths of from 3 to 6 fathoms clay. About 2 miles seaward of the island the depths are 8 and 9 fathoms.

Ras Sidarra is a low ill-defined sandy point, 4½ miles northward of Sireir, the coast between being alternately sand and cliff. On the point is a small village and a date grove, and immediately inland are several groups of conical hills.

The soundings off this coast are regular, with muddy bottom.

Ras Nakhreir.—*(Lat. 19° 57′ N., Long. 57° 48′ E.).*—From Ras Sidarra the coast trends northward about 5 miles to Ras Nakhreir, a bold bluff point rising 465 feet above the sea; for 2 miles southward of it the coast is of the same bold nature, being a perpendicular cliff down to the water's edge.

From Ras Nakhreir, the coast again trends northward 12 miles to Ras Saráb, the beach being sandy the whole way, with a range of hills from 700 to 800 feet high rising abruptly above it. At 3¼ miles from Ras Nakhreir is Ras Eikeit, a low sandy point.

From Ras Sidarra to Ras Saráb, the shore is safe to approach, there being from 4 to 5 fathoms one mile from the beach. Beyond this distance is an extensive flat with depths of from 6 to 15 and 20 fathoms, with muddy bottom towards the shore, but sand and shells, with patches of coral, farther out.

Ras Saráb is a low sandy ill-defined point, near which is a small village. Fresh water is procurable at this point, the fishermen being willing to carry it off to a vessel at a reasonable charge.

From Ras Saráb the coast trends north-eastward 13 miles to Ras Bintót; the shore is low sandy and forms the bay called Ghubbet Saráb.

Jebel Shabatein, a conspicuous peaked hill 483 feet high, lies 8 miles westward of Ras Bintót, and is an excellent mark for avoiding the dangerous breakers of Shab Ghubab.

General chart 1012.

Chart 10c, North-east coast of Arabia. Var. 1° E.

Ras Bintót (*Lat. 20° 19′ N., Long. 57° 58′ E.*) is a low wide sandy point, forming the north-eastern extreme of Ghubbet Saráb, and the south-western extreme of Ghubbet Bintot. From the southern side of this cape, a rocky 3-fathoms spit extends southward 4 miles, with depths of from 6 to 7 fathoms, mud, close to it.

Ghubbet Bintót lies between Ras Bintót and Ras Abana; the shore is sandy and backed by a range of hills rising from Ras Abana, which turn away westward on the northern side of Jebel Shabatein. The bay is free from danger, the depths varying from 3 to 6 fathoms, mud.

Ras Abana is a low rocky point, with the low range of hills before mentioned rising from it; it is the western point of entrance to Ghubbet Hashish.

Water.—Fresh water may be procured at this point in small quantities, the natives supplying it at a reasonable charge.

GHUBBET HASHISH, at the head of the gulf of Masira, is a bay 7 miles wide and 9 miles deep between Ras Abana and Ras Shijarét, with depths of from 3 to 7 fathoms in the entrance. In approaching the bay, care must be taken to avoid the foul ground extending 7 or 8 miles southward of Bar-al-Hikman peninsula, and Shab Iziyat described on page 534.

The shore of the bay is low sandy and desolate throughout. On the western side is a low range of hills inland. Close to the shore, at 1¾ miles northward of Ras Abana, is a pyramidal hill 120 feet in height.

Near the centre of the bay is Ab island, a low rocky islet with a small rock off its southern end, from which a mud bank extends 3 miles in a northerly direction, dividing the bay into two parts, then spreading out on either side eastward and westward, and extending from the northern shore of the bay a distance of 3 miles. This mud bank dries at low water, rendering the shore anywhere near the head of the bay inaccessible before half flood.

Village (*Lat. 20° 32′ N., Long. 58° 10′ E.*).—On the mud bank near the head of the bay are the two islands, Rig and Mahut. Rig is rocky and steep: Mahut is low, sandy, and thickly covered with shrubs and mangrove bushes. Mahut has on it a wretchedly poor hut village belonging to the Jeneba tribe. A creek leads through the mangroves up to this village but it has only a depth of 2 feet at high tide and is therefore for

many hours dry. The landing anywhere is very difficult except at the top of high water.

On the north-eastern side of the bay is the entrance to a creek reported by the natives to communicate with the Masira channel; but more probably with Khor Milh, a salt-water lagoon close to the beach, eastward of Ras Zeiwari.

Anchorage.—The portion of the bay eastward of Ab island is 2 miles wide, with from 1½ to 3 fathoms, sand. That part of the bay westward of Ab island is 5 miles wide, with from 3 to 6 or 7 fathoms, mud. In August 1907, H.M.S. *Lapwing* anchored here in 7 fathoms with Rig island bearing N. ½ E., and Ab island E. ½ S., from which it would appear that the depths in this bay may be somewhat better than are shown on the chart.

Supplies.—Very good sheep or goats, firewood, and fresh water have sometimes been procured at the village on Mahut island.

Tides.—It is high water, full and change, at Jezírat Ab at 10 h.; springs rise 10 feet. The flood sets north-north-westward into the bay, the ebb in the opposite direction, at about three quarters of a mile an hour.

BAR-AL-HIKMÁN PENINSULA, which divides the Masíra channel from Ghubbet Hashish, is very low, sandy, and covered with bushes for many miles.

Ras Shijarét, off which is a small rocky islet, is the low sandy western point of the Bar-al-Hikmán peninsula, and is the eastern point of entrance to Ghubbet Hashish.

From Ras Shijarét the coast trends south-eastward 5½ miles to Ras Zeiwari, with Ras al Hassí, a low round sandy point, about midway between them, and from thence eastward 10 miles to Ras Mishsiýu. It is low sandy and desolate for the whole distance, and fronted by a coral bank which dries at low water and extends from half a mile to 1½ miles from the shore, with overfalls at from one to 3 fathoms extending 3 miles offshore.

Ras Zeiwari (*Lat. 20° 21′ N., Long. 58° 16′ E.*), the south-western point of Bar-al-Hikmán peninsula, is a low sandy point. Immediately inshore to the eastward, and separated from the sea by a narrow ridge of sand, is Khor Milh, a large salt-water lagoon.

General chart 1012.

Chart 1089, Masíra channel. Var. 1° 10′ E.

Ras Mishsiŷu is the low sandy south-eastern point of Bar-al-Hikmán peninsula and forms the western boundary of the southern entrance to the Masíra channel.

Plan 1089, Masíra channel.

MASÍRA ISLAND (*South extreme, Lat. 20° 10′ N., Long. 58° 38′ E.*).—From its southern end, Masíra island is about 36 miles long in a north-north-easterly direction by 10 miles wide, and has an area of nearly 200 square miles. It is from 8 to 12 miles distant from the mainland, between which and it are many islets, shallow banks, and rocky patches, leaving only narrow navigable channels.

The island is generally of a hilly aspect, but low in the centre and at the northern extreme; *see* view on plan. The hills form clusters of small peaks, the greatest height being 620 feet, and the average about 400 feet. Approaching the island from the northward or north-eastward, the most conspicuous hill is Jebel Mathrub, a rounded hill on the northern range 620 feet high and standing amid a cluster of lesser hills, one of which about 1¾ miles north-eastward of Jebel Mathrub, is named Sharp peak, from its peculiar form. Nearly all the hills are of volcanic formation, except some table land in the vicinity of Ras Yei, the eastern extreme of the island.

The island itself is barren and sterile, producing no vegetation beyond two or three date groves and a few pumpkins. The animals found are a few gazelles, hyaenas, jackals, and wild asses.

Copper ore of a poor quality exists in the southern part of the island near Jebel Sawir; the remains of smelting furnaces, said to have been used by the Persians many years ago, are still to be seen.

The depths on the eastern side of the island are irregular as regards distance from the shore, but increase gradually to seaward. There are several shallow patches at some distance from the shore, as hereafter described.

Population.—Produce.—The population of Masíra island is scanty, amounting probably to about 1,000 souls, chiefly of the Jeneba tribe, and mostly very poor, subsisting chiefly on fish, and formerly thought to be not over friendly to Europeans; they have no cattle, but possess a few dhows and many fishing-boats. Fish of very excellent quality are plentiful all round the island. Sharks abound, and are caught for their fins and tails, which are dried and exported to Maskat for the Chinese markets.

Turtles are very numerous between Masíra and the mainland, but more particularly in the neighbourhood of Ghubbet

Chart 1089, Masíra channel. Var. 1° 10′ E.

Hashish. There are two kinds, the edible, probably the *Chelone mydas*, and the inedible *C. imbricata*, or hawk's-bill turtle, both common to the Indian Ocean. The latter, or inedible turtle as it is termed from its being so much less fleshy and fat, yields the turtle shell of commerce. The inedible turtle is much scarcer than the edible one. The carapaces of both species are used by the Arab fishermen for fireplaces in their boats.

Ambergris is sometimes found at Masíra, as well as on the opposite coast. The sperm whale is common, also several other species of cetacea, and myriads of cuttle-fish and cephalopods of all kinds, on which the whale feeds.

The climate of Masíra is generally healthy. In the North-east monsoon the thermometer ranges from 68° to 78° Fahrenheit. Rain is very uncommon, but, judging from the enormous watercourses visible in all parts of the island, it must fall heavily at times.

East and north coast of Masíra.—Ras Abu-Rasas (*Lat. 20° 10′ N., Long. 58° 38′ E.*), the southern point of Masíra island, is a low rocky sharp point, having Jebel Sawir, a conspicuous conical hill 468 feet high, about 2 miles north-eastward of it.

From Ras Abu-Rasas, the eastern shore of the island trends north-eastward 10½ miles to Ras Keida, with small rocky points and sandy bays intervening; the hills rising abruptly from the beach. Ras Dtharri is a projecting rocky point 6 miles north-eastward of Ras Abu-Rasas; Jebel Dtharri is just within it. The shore, northward of the reefs already mentioned, is fairly bold, there being nowhere less than 5 fathoms within one mile of the shore, and though the shore has a narrow rocky fringe there are no outlying dangers until off Ras Keida.

From Ras Keida to Ras Zafarnát, 16 miles distant in a north-easterly direction, the coast recedes slightly, but is regular, with a low rocky beach, and with only one small sandy point occurring between the points named. The shore is safe to approach, the soundings being regular and there being no hidden danger.

Reefs.—About 8 cables south-westward from the point is the small breaking patch Shab Abu-Rasas, with 5 and 6 fathoms water between it and the point. Shab Matreih, a coral reef with from 3 to 6 feet water, extends 1½ miles westward of Shab Abu-Rasas, but a narrow 5-fathoms channel divides them. At 1¼ and 2¼ miles east-south-eastward from the point and within the 10-fathoms line are two other reefs, the nearest having

Chart 1089, Masíra channel. Var. 1° 10′ E.

depths of 2 fathoms, the other 4 or 5 fathoms. As the sea frequently breaks on all these reefs, the southern point of the island should not be approached to less than 3 miles.

Ras Keida (*Lat. 20° 16′ N., Long. 58° 47′ E.*) is a small rocky point which may be known by a black double-peaked hill rising close to it. The shore reef extends about 7 cables from the Ras in a north-easterly direction, with only a few feet water over it, and breaking down to 4½ and 6 fathoms at its outer edge.

Reef.—A coral reef lies 1⅔ miles eastward of Ras Keida, with depths of 3 to 5 fathoms water, and with from 7 to 10 fathoms between it and the shore. When the sea is smooth there is no indication of shoal water, but with the slightest swell the sea breaks heavily. Vessels should therefore avoid anchoring on this or any shallow bank round the island.

Hakkan.—This small village is in a date grove close to the beach, 4 or 5 miles northward of Ras Keida. About 4 miles northward of Hakkan is the narrow central part of the island where it is only 4 miles across from shore to shore, the land consisting of low undulating hills.

Supplies.—Fresh water is procurable at the village of Hakkan, also a few pumpkins.

Ras Zafarnát, less than 2 miles south-westward of Ras Yei, is a rocky point from which the hills rise abruptly.

Ras Yei (*Lat. 20° 32′ N., Long. 58° 58′ E.*), the eastern extreme of Masíra island, is a bluff point formed by a ridge of hills extending eastward from the centre of the island, of which Jebel Mathrub, 620 feet high, is the highest, most conspicuous, and of obtuse form. The depths off Ras Yei are 15 fathoms at one mile, the edge of the bank in 100 fathoms being 10 miles offshore. From this point the land trends in a north by west direction for 10 miles to Ras Jidufa at the northern end of the island.

Ras al Jezírat is a rocky point 3½ miles north-north-westward of Ras Yei, between which two points the shore is rocky but free from danger, though the depth is under 3 fathoms when less than 5 cables from the shore, and a 5-fathoms patch surrounded by 7 and 8 fathoms lies 1¼ miles offshore from the centre of the bay. It derives its name from a sandy islet called Jezírat Janzi, lying close off and northward of it. The point is prominently marked by a black cove.

General charts 10c and 1012.

Chart 1089, Masíra channel. Var. 1° 10′ E.

From Ras al Jezírat, the shore curves westward and then northward, forming a bay between it and Ras Jidufa, 7 miles distant.

Ras Jidufa (*Lat. 20° 42′ N., Long. 58° 55′ E.*).—Ras Jidufa, the north-eastern extreme of the island, is a rocky point with two horns 5 cables apart, and a slight identation between them; a hill of the same name rises immediately from the shore of the bay. Off this double point, a reef extends half a mile, with shallow water at its edge; the point should therefore not be approached in any direction nearer than one mile.

Reef.—In the bay between Ras al Jezírat and Ras Jidufa is a rock awash at low water, 1¼ miles from the shore, with the southern horn of Ras Jidufa bearing N. ½ W. 4½ miles; close round the rock the depths are 2½ and 4 fathoms. The soundings in the bay are regular, there being from 7 to 9 fathoms at 2 miles offshore, the depth decreasing gradually towards it.

Anchorage.—There is anchorage in 7 fathoms, sand and rock, about 1½ miles north-north-west of Ras Jidufa, but it is said to be bad, probably on account of the nature of the bottom, and landing is very difficult from the generally heavy surf and the rocky nature of the shore.

Ras Hilf, the north-western point of the island, is low and sandy; at 1¾ miles southward of it, and near the western shore, is Jebel Hilf, a moderately high black hill. The coast between Ras Jidufa and Ras Hilf is fronted by several patches of rocks, dry at low water, extending from a quarter to half a mile offshore.

Shoals.—Between N. by W. from Ras Hilf and N. ½ E. from Ras Jidufa, and distant from 3 to 5 miles from the shore, are five patches with as little as 2¼ fathoms on them; between them and the island the depths are from 3½ to 7 fathoms.

Between the north extreme of Masíra and the mainland, and as far northward as Sheiballa, the ground is foul, with depths of from 2 to 4 fathoms, on which the sea rolls heavily during the North-east monsoon, rendering this end of the Masíra channel unapproachable in that season, except in boats.

Clearing mark.—Jebel Jidufa bearing S.S.W. leads eastward of all these shoals.

MASÍRA CHANNEL and West coast of Masíra island.—The Masíra channel, between Masíra island and the mainland, is about 35 miles long by from 8 to 12 miles wide. Near its northern end, though its width between Ras Shanna

Chart 1080, Masíra channel. Var. 1° 10′ E.

on the mainland and Ras Hilf on Masíra island is no less than 8½ miles, its navigable width, with a depth of only about 3 fathoms at low water, is restricted to 2½ cables or less, and it should not be attempted at all by vessels unless bound to Daua or to Umm Rasas. The channel is used by native vessels of about 40 tons. *See* Directions, page 547.

From Ras Hilf, the north-western point of Masíra, the coast trends south-westward 11 miles to Ras Shaghaf, forming a slight curve and fronted by a bank which dries at low water from 5 to 8 cables offshore, rocky foul ground extending in places from one to 2 miles from the beach.

Kinasat Hilf is a shoal, partially dry at low water, between the northern entrance points of the Masíra channel and 1½ miles westward of Ras Hilf, with depths of from 3 to 7 fathoms between it and the point. Between it and Dimma reef, extending from the mainland shore, the depth is but 1½ fathoms, sandy bottom, the channel thus lying eastward of Kinasat Hilf and along the western shore of the island.

Daua or Datta (*Lat. 20° 36′ N., Long. 58° 50′ E.*) is the principal village in Masíra, and stands in a date grove close to the shore and 2 miles northward of Ras Shaghaf. It consists of about 150 rudely thatched huts, built of mud and stone, and contains a population of about 600. It is the residence of the Sheikh of the island. The people are mostly very poor and appear to be either fishermen or shepherds; they are civil and obliging to strangers and have been known, in recent times, to show great kindness to shipwrecked people; a few of the wealthier class possess date groves on the mainland.

Water.—Good water may be obtained by ships' boats from two wells at the northern end of Daua, and there is good anchorage for them on the western side of Jezirat-bin-Juwaisim. These wells are surrounded by a conspicuous belt of palm trees about 180 yards in circumference, which trees, when approaching from the northward, are seen long before the village.

Good water may also be obtained at Ras Shaghaf, off which there is anchorage in 4 or 5 fathoms, at from one to 1½ miles from the shore.

Beiyat-bin-Juwaisim.—Jezirat-bin-Juwaisim is an islet 2 miles from the Masíra shore, on and near the eastern edge of Beiyat-bin-Juwaisim, which shoal is 7½ miles long north-east and south-west, by 3 miles wide, and, when surveyed the greater part dried at low water, but the drying portion is reported to have much decreased in size. There is good

Chart 1089, Masíra channel. Var. 1° 10′ E.

anchorage for boats on the western side of the island, there being a gap in the reef on its north-western side, which allows boats to get close in. The northern edge of Beiyat-bin-Juwaisim is one mile from Kinasat Hilf, and there are only from 2 to 4 fathoms between them. On either side of the shoal is a navigable channel for small craft, with from 3 to 4 fathoms water. *See* directions, page 547. Near the south-western edge of Beiyat-bin-Juwaisim, where the general depths are 3 and 4 fathoms, is a small 2-fathoms patch.

From Ras Shaghaf the coast trends more southward to the village of Umm Rasas, about 3 miles distant, and from thence 3 miles farther southward and then westward about the same distance, forming the deep bight of Umm Rasas. In this bight lies the low sandy island Jezírat Shagha, which cannot be approached within 1½ miles on account of a bank, dry at low water, extending from the southern shore of the bight and surrounding the island at that distance. Between Jezírat Shagha and the eastern shore of the bight is a narrow inlet, presently described.

At the southern end of Beiyat-bin-Juwaisim, the channels round that reef join, being bordered on the eastern side by the rocky ground extending off Masíra; and, on the west, by the bank of foul ground extending from 6 to 8 miles from the mainland and terminating at Jezírat-al-Hara, one of the Oyster islets. The depths in the channel are from 4 to 8 fathoms, with the exception of one small 3-fathoms patch in mid-channel about 1½ miles north-eastward of Jezírat Sanfar; the width varies from 4 miles off Ras Shaghaf to 7 cables only between the Oyster islets and the rocky bank extending from the Masíra shore northward of Ras Kalbán.

Umm Rasas is a small village, containing, with Safaij, adjacent to it, about 100 people. The village is fronted by Jezírat Shagha, surrounded by the flat before mentioned. Between this flat and the village is an inlet passing close along shore and entered from the northward. It has depths of from 1½ to 3 fathoms, runs in 3½ miles, and is from 2 to 4 cables wide; by it small craft can get close up to the village.

Jebel Safaij is a conical hill close southward of the village of that name, with the remains of a fort on the summit.

From the western point of Umm Rasas bight, the coast trends south-westward 8 miles to Ras Kalban; it is rocky and irregular with small projecting points, and, for 7 or 8 cables from the shore, is fronted by a rocky bank with many rocks above water.

Ras Kalban (*Lat. 20° 21′ N., Long. 58° 38′ E.*) is a low rocky point with a sandy beach on either side, from whence the

Plan 1089, Masíra channel. Var. 1° 10′ E.

coast trends south 11 miles nearly, to Ras Abu-Rasas, the southern extreme of Masira islands.

From Ras Kalbán to Ras Abu-Rasas, the southern point of the island, described at page 540, the shore is low and sandy, with several low points. At 1¾ miles northward of Ras Abu-Rasas, and close inshore, are two islets, and 1¼ miles farther northward are three more islets lying in an east and west direction, with some sunken rocks beyond them, extending altogether nearly 1¼ miles from the shore. The whole collectively are called Banat Murshid.

Jebel Kairán, or Saddle hill, is a remarkable double-peaked hill 385 feet high one mile from the beach, and nearly 4 miles north-eastward from Ras Kalbán. The little village of Kairán is at the south-western foot of the hill.

Oyster islets.—North-westward of Ras Kalbán are these three rocky islets. Between Jezírat Sanfar, the northern islet, and Jezírat Al-Hara, the next, which lies 2 miles south-westward from it, are two patches of sunken rocks and from 2 to 3 fathoms water on the bank between the islands and the rocks. Jezírat Amkads, the southern islet, lies one mile west-north-west from Ras Kalbán, and makes from the south-westward as a patch of sand with a small black rock at its western end. The islet can be seen about 7 miles distant.

SHOALS.—A shoal about half-a-mile long on a south-south-easterly line, and with about 1¾ fathoms water, lies with its northern extreme one mile westward of Jezírat Amkads. Shallow water also extends a short distance northward of the islet.

Zanatiyat, a dangerous group of rocks about 1½ miles in extent, with one rock dry at half tide and others with less than 6 feet water over them and from 4 to 6 fathoms around, lies 3 miles south-westward of Ras Kalbán.

Other shoal patches of from 2¼ to 3 fathoms lie nearly 3 miles south-westward and south-south-westward of Zanatiyat reef.

Shab Sanfar (*Lat. 20° 12′ N., Long. 58° 35′ E.*) is a reef nearly awash, 8 cables long north and south by half a mile wide, and its centre and shoalest part distant from the shore 2¾ miles, with the south cone of Jebel Sawir bearing S. 82° E. This shoal usually breaks, and may be seen from the masthead at a considerable distance.

Hassar Walad Henal (*Lat. 20° 28′ N., Long. 58° 41′ E.*). —Westward of Umm Rasas, and on the edge of the western bank of the channel, is Hassar Walad Henal, a dangerous

General charts 10c, and 1012.

Plan 1089, Masíra channel. Var. 1° 10′ E.

sunken rock with only 2 feet water and steep-to, from which Jebel Kairán bears S. ¾ E., and Jebel Safaij is in line with the southern point of Jezírat Shagha.

Kalbán is a small village close to the shore, about 5 miles from the southern point of the island.

WESTERN SHORE of MASÍRA CHANNEL.—For the first 13 or 14 miles from Ras Mishsiýu, its southern extreme, this shore is low and rocky with intermediate sandy patches; when within 11 miles of Jezírat Maáwal it becomes sandy, and so remains as far as and beyond Ras Shanna.

Beiyat Dimna is a very extensive reef, the greater part of which dries at low water; commencing from the shore about 10 miles north-eastward of Ras Mishsiýu, it gradually increases in width until abreast of Ras Shanna, where it extends nearly 6 miles from the shore, and dries 4½ miles out into the Masíra channel. Abreast of Ras Shanna the reef ends, but shallows of 1½, 2, and 3 fathoms extend almost across to the northern end of Masíra island.

From the head or north-eastern end of Beiyat Dimna, a sandbank with from 1½ to 2½ fathoms water extends southward as far as the Oyster islets, forming the western side of the navigable portion of the Masíra channel; from thence it turns sharply back towards the mainland and rejoins the shore about where Beiyat Dimna shoal commences. A small reef of rocks, covered at high water, lies about 2 miles offshore on this inner part of the sandbank.

Ras Shanna (*Lat. 20° 45′ N., Long. 58° 41′ E.*) is the low sandy point forming the western point of the northern entrance to the Masíra channel. It bears N.N.W. 8½ miles from Ras Hilf on Masíra island, the eastern point of entrance.

At 3 miles southward of Ras Shanna is Jezírat Maáwal, a low wooded islet connected with the mainland at half-ebb; a creek in the reef open from the northward, and navigable for boats, leads up to it.

Tides.—It is high water, full and change, at the village of Umm Rasas at 10h.; springs rise 10 feet. The flood stream sets westward round the northern end of the island, and south-south-westward down the channel; round the southern end the flood stream sets west-north-west, and from thence north-north-eastward up the channel, the two streams meeting about off Umm Rasas village. The ebb streams part at about the same place and set the contrary way to the flood streams. The rate of the streams varies from 1½ to 2½ miles an hour.

General charts 10c, and 1012.

Plan 1089, Masíra channel. Var. 1° 10′ E.

DIRECTIONS for Masíra channel. — During the North-east monsoon, and in bad weather, the sea breaks heavily on the foul ground off the northern entrance, at which time that channel should not be attempted. At all times the southern entrance is preferable, it being much the wider and deeper of the two, but great caution must be used in its navigation until it is better known, as shoals may exist which do not appear on the chart and the depths may be less in places than those shown; in addition to which there is an entire absence of leading marks.

North entrance.—If the weather is clear the line of the shoals is generally well defined, and it is said that little danger or difficulty would be experienced by vessels of suitable draught, except northward of Jezírat-bin-Juwaisim, where the greatest depth at low water appears to be 3 fathoms, and the channel in one place is scarcely more than 2 cables wide.

Approaching from the north-eastward, Jidufa hill, at the north-eastern extreme of Masíra island, should be kept bearing westward of south-south-west in order to avoid the shoals and foul ground northward of the island; in thick weather do not stand into less than 15 fathoms, as the water shoals quickly within that depth. When within 1½ miles of Ras Jidufa, haul to the westward, keeping about a mile offshore until Ras Hilf bears South in order to avoid the 2-fathoms elbow of the shoal extending 7 or 8 cables from the shore just eastward of the Ras; then haul sharply to the southward and steer to past Ras Hilf at from 3 to 5 cables. After passing Ras Hilf, steer about S.W. by S. for Jezírat-bin-Juwaisim until Jebel Hilf approaches the bearing of E. by N.; here the channel between the reefs is less than a quarter of a mile wide, with about 3 fathoms water, and a short distance farther on is a 2¼-fathoms patch in mid-channel, which may be passed on either side. The piloting of this part of the channel should be done from aloft. When southward of this narrow part, the course is again about S.W. by S., passing from 6 to 8 cables eastward of Jezirat-bin-Juwaisim; about the same course should carry a vessel either to an anchorage off Daua, or, 3 or 4 miles farther on, to that off Umm Rasas, where a vessel may anchor in 3 fathoms, with the old ruined tower bearing S.E. ½ S. and Jebel Kairán S.S.W. ½ W., a convenient spot from which to communicate with the village. There are from 4 to 4½ fathoms a little farther offshore.

Another and wider channel leads northward and westward of Beiyat-bin-Juwaisim; but the eastern channel, being the more direct, is perhaps preferable.

To pass through this north-western channel, however, proceed round Ras Hilf as before directed until Jebel Hilf bears

Plan 1089, Masíra channel. Var. 1° 10′ E.

about E. ½ S.; keep it on that bearing astern until Jezírat-bin-Juwaisim bears S. 16° E.; then steer south-westward until the same islet bears E. by S. ½ S., when a course may be steered S. ¾ W. for Jebel Kairán until the ruined tower at Umm Rasas bears about S.E., when the anchorage off that place may be steered for.

The navigable channel abreast of Umm Rasas is 2 miles wide, increasing in width at first to the northward, until nearly blocked by the shoal Beiyat-bin-Juwaisim, and decreasing to the southward. The eastern side is bounded by the bank of rocky ground, with some rocks above water, which extends from the shore of the island, and should not be approached to less than 8 cables or a mile. The opposite side of the channel is bounded by a sandbank with from 1½ to 2 fathoms water on it, and steep-to. The depths in the channel vary between 4 and 7 fathoms, the latter depth but rarely found in the northern half of the channel.

South entrance.—In the southern entrance to the Masíra channel the depths are from 7 to 9 fathoms, sand and coral, with occasional overfalls, decreasing to 6 and 5 fathoms near the Oyster islets, and though there is one mid-channel patch of 3 fathoms, a least depth of 4½ fathoms should be maintained as far as Umm Rasas.

Entering the channel from the southward or south-eastward, Ras Abu-Rasas may be rounded 4 miles distant; from thence a course should be steered gradually increasing the distance from the island to avoid the off-lying shoals and shallow ground, until Jebel Kairán bears N.E. by E. ½ E., when a direct course should be steered for Jezírat Al-Hara, keeping that islet bearing N.E. ¼ E. until Jezírat Amkads bears southward of east, when the course may be altered to E. by N. ½ N. to pass midway between Al-Hara and Amkads until the latter bears S.W. by S., when it should be kept on that bearing astern, the vessel steering up through the channel on a N.E. by N. course to the anchorage off Umm Rasas, except that when Jebel Kairán is approaching the bearing of S.E. ½ E., a slight sheer to starboard should be made to clear the mid-channel 3-fathoms patch before mentioned.

If desirous of entering the narrows southward of Jezírat Amkads, that islet may be steered for when it bears about N.E., passing northward of Zanatiyat shoals and southward of the shoal whose southern end lies one mile south-westward of Jezírat Amkads; from thence passing about 3 cables southward and eastward of Amkads and bringing it to bear S.W. ¾ S. astern, as before. Jezírat Amkads may, if necessary, be passed at 3 cables

Plan 1089, Masíra channel. Var. 1° 20′ E.

on its western side, between it and the shoal lying south-westward of it; but, if so, in hauling into the channel northward of it, care must be taken to avoid the shallow water extending a short distance from its northern side.

Chart 10c, North-east coast of Arabia.

COAST.—Ras Sheiballa (*Lat 20° 58′ N., Long. 58° 49′ E.*) is a low rocky point on the mainland, about 16 miles northward of Masíra island; the coast between it and Ras Shanna, 13 miles south-south-westward of it, being very low, sandy, and covered with bushes.

As before stated, a bank of foul ground, with from 2 to 4 fathoms water, extends from Ras Sheiballa to the island of Masíra, on which the sea rolls heavily during the North-east monsoon. *See* page 542.

From Ras Sheiballa, the coast trends north-eastward 43 miles to Ras Jibsh, with the villages of Ghalát, Sherkh, and Grun lying between: Sherkh, situated about midway between the two points, is said to be the seaport of a considerable community residing a short distance inland, who foster the slave trade. For 13 miles the land rises in cliffs from 30 to 70 feet high, with sandy spaces intervening; after which it presents an unvaried line of low sand downs without the slightest trace of vegetation or inhabitant. The heavy surf on the shore renders landing impracticable.

From Ras Jibsh to Ras Al-Khabba, the coast has a north-north-easterly trend for 53 miles; it is all low and sandy and of an uniform desolate appearance, with several small isolated hills near the shore, one of which, Jebel Jifan, is of a rounded form.

Sheiballa village.—About a mile inland from the point is Sheiballa village, containing about 200 inhabitants of the Jeneba tribe.

The Jeneba have but few boats, and being very poor, were formerly if not now, obliged to have recourse to the kirbeh, an inflated sheepskin, for their fishing operations. It is or was commonly used by the inhabitants of this coast from Ras Al Ruweis to Khorya Morya bay.

Supplies.—A few goats may be obtained at Sheiballa, as also at nearly all the villages on this part of the coast.

Inhabitants.—Caution.—The whole coast from Ras Minji as far northward as Ras Jibsh, a distance of about 330 miles, is mainly inhabited by the Jeneba tribe, who bear a generally bad character. From Ras Jibsh to Ras Al-Hadd, the inhabitants are of the Bu-Ali tribe, and are friendly to Europeans.

General chart 1012.

Chart 10c, North-east coast of Arabia. Var. 1° 30′ E.

The country bordering on the sea between Ras Jibsh and Ras Al-Hadd is styled Al-Askhara, or the eastern country, and forms no portion of the province of Oman, which lies contiguous to it on the West and near the coast. It is entirely destitute of vegetation near the shore, but in the interior it has extensive date groves and running streams, with small patches of cultivation, chiefly jowari and cotton.

Ras Jibsh (*Lat. 21° 28′ N., Long. 59° 21′ E.*) is a small sandy point, having immediately over it a hill about 100 feet high and nearly covered to the summit with white drift sand, three little dark peaks showing above the sand. On the centre peak are the remains of an old tower. On the south-western slope of the hill is a village containing about 60 inhabitants. In clear weather, Jebel Jaálan, 42 miles to the northward, 3,900 feet high and wedge-shaped, may be seen when off Ras Jibsh.

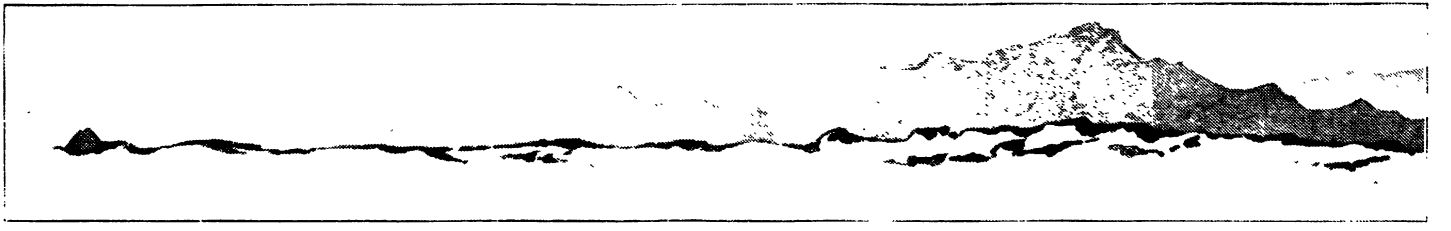
Landing.—On the northern side of the Ras Jibsh is a small bay, affording good landing in southerly winds, but much exposed to north-easterly winds.

Depths.—The soundings in this vicinity are very regular, the 20 fathoms line being 3½ miles off Ras Jibsh, and increasing in distance from the shore to the southward. The shore may be safely approached in any part to a depth of 5 fathoms.

The bank of soundings decreases in width northward of Ras Jibsh, where the 100-fathoms contour-line is about 11 miles from the land, until at Ras Al-Khabba it is only 2 miles from the shore, and the 20-fathoms line one mile only; the lead, therefore, gives but little warning here. The soundings southward of Ras Al-Khabba are regular, and the shore may be approached anywhere to the distance of one mile.

AL-ASKHARA is a long straggling town and fort 27 miles north-eastward of Ras Jibsh, containing about 1,000 inhabitants of the Bu-Ali tribe. This place was visited by H.M.S. *Arab* in 1877; the country in the neighbourhood was reported to be a desert, affording no supplies beyond a few goats and fowls.

Anchorage.—North-eastward of the town is a rocky point, the shore from which sweeps round in a north-westerly direction, thus forming a small bay, with apparently a clean and clear bottom, the soundings decreasing gradually to the beach. The *Arab* anchored in 7¼ fathoms water, from 5 to 7 cables from the beach. Landing was effected without difficulty in



Jebel Jaálan from the South-eastward.

Chart 10c, North-east coast of Arabia. Var. 1° 30′ E.

this bay, although the surf broke heavily on the shore on either side of it.

Jebel Seih, an oblong black hill several hundred feet high, lies about 6 miles north-westward from Al-Askhara, and has a haycock or conical hill a short distance north-eastward of it. Jeble Seih, when bearing about W.N.W., forms a saddle and is a good mark for making the place.

Ras Gumeila (*Lat. 21° 59′ N., Long. 59° 40′ E.*) is a low sandy point about 9 miles north-eastward of Al-Askhara, backed by a ridge of low hills, one of which, Jebel Gumeila, is of conical form, but is not easily discernible from the north-eastward. The rather large town of Gumeila is about one mile northward of the point. Water may be obtained here.

Khor Beni-bu-Ali. — At 5½ miles northward of Ras Gumeila, with Jebel Jaálan bearing N.W. by W. ¾ W., is a large black rock which effectually masks the entrance which formerly existed to the khor Bini-bu-Ali, discovered by H.M.S. *Kingfisher* in 1886.

The place was not examined, but to all appearance there was at that time an opening close to the black rock leading into a rather extensive khor. In the same year about 30 small coasting craft were observed to be hauled up in the khor by the officers of H.M.S. *Sphinx*, but when visited by H.M.S. *Cossack* in April 1891 the black rock appeared to have become part of the beach and any entrance there might formerly have been was entirely closed.

A fort and one stone house may be seen about 2 miles northward of the khor, and Suweih, a considerable village consisting of mud huts, exists here during the North-east monsoon, but the villagers take to the hills during summer.

Ras ar Ruweis is a low rocky point with a few sandy hillocks, about 3 miles south-westward of Ras Al-Khabba. Here is a village containing about 300 inhabitants of the Bu-Ali tribe.

From 2 to 4 miles southward of this point, a coral bank of from 7 to 10 fathoms water, with overfalls, extends about 2 miles offshore.

Jebel Jaálan. — This conspicuous mountain, its highest peak in Lat. 22° 13′ N., Long. 59° 22′ E., and about 19 miles inland from Suweih, the nearest part of the shore, is 3,900 feet high, and in clear weather may be seen at a distance of 60 miles. At the southern slope are the chief towns of the Bu-Hassan and Bu-Ali tribes, who are rather friendly to Europeans.

General chart 1012.

Chart 10c, North-east coast of Arabia. Var. 1° 30′ E.

RAS AL-KHABBA (*Lat. 22° 12′ N., Long. 59° 49′ E.*) is a low rocky point. Here the sandy shore terminates, and cliffs of from 60 to 100 feet in height extend with but a few short breaks to within 3 or 4 miles of Ras Al-Hadd. All this part of the coast is very bold and with no safe anchorage.

From 20 miles southward of Ras Al-Khabba, the high mountains of Kalhát will be seen towering behind Jebel Jaálan.

Anchorage.—There is tolerable shelter for northerly winds in 6 fathoms, with Ras Al-Khabba bearing N.E. by N. about 2 miles.

Jebel Khamis, 2,700 feet high, is a rugged peak of dark colour, and is seen to the northward of Jebel Jaálan from off Al-Askhara.

Jebel Sifan consists of two remarkable hills close together south-westward of Ras Al-Juneiz. They are quoin-shaped, of equal height, 850 feet above the sea, with their steep faces westward, and stand on a table land 100 feet in height. Being isolated and close to the shore, these hills, visible above 30 miles, make good landmarks for identifying Ras Al-Juneiz; and, when the comparatively low land in that vicinity is below the horizon about 15 miles distant, they appear, either from the northward or southward, like an island with a deep notch in it.

Ras Al-Juneiz, the most eastern point of Arabia, lies 7 miles southward of Ras Al-Haad. It is a low cliff which continues for some distance to the northward but sinks to a low sandy shore some 3 miles southward of Ras Al-Hadd. Off Ras Al-Juneiz, at a distance of 2 miles, there is a depth of 100 fathoms.

RAS AL-HADD (*Lat. 22° 32′ N., Long. 59 48′ E.*).—The low cliffs of Ras al Juneiz sink into a low sandy shore 3 miles southward of this cape, which is itself a low sandy point, difficult to make out; the little town of Al-Hadd, consisting chiefly of mat huts, with a few date trees, three round towers, and a population of about 700 of the Beni Ghazal tribe, lies one mile south-westward of it. A fourth round tower stands detached on Ras Dhaletya on the shore of Khor Al-Hajar. The people are civil, as are the inhabitants of all towns northward of this and subject to the Sultan of Maskat, but the authority of that prince southward of this point is quite nominal.

Supplies—A few goats and an abundance of fish may be procured here. Fairly good water, but only in small quantities, may also be obtained.

General chart 1012.

Chart 10c, North-east coast of Arabia. Var. 1° 30′ E.

Anchorage.—A vessel can anchor with Al-Hadd town bearing West, in from 8 to 10 fathoms, coral, at from 5 to 8 cables offshore; the water is very clear and shoals rapidly from 10 to 7, 6, and 5 fathoms, the bottom being distinctly visible. This anchorage is open to all winds from the sea. In the South-west monsoon, the best anchorage is between the entrances to Khor Al-Hajar and Khor Jarama, in 12-fathoms, about 2½ cables offshore. Vessels at this, or any other anchorage between Ras Al-Hadd and Sur, should always be prepared for a sudden shift of wind to the northward.

Temperature.—The temperature at this anchorage, varying between 83° by day and 74° at night, in September, is a great relief after the suffocating heat at Maskat. The air is also drier than southward of Ras Al-Hadd, as it loses some of its moisture in passing over the land.

Tides.—It is high water, full and change, at Ras Al-Hadd at 9h. 30m.; springs rise 9 feet. At the anchorage off Khor Al-Hajar, the flood stream, always weak, sets westward; the ebb stream eastward, its greatest rate about 1½ knots.

Bank.—In 1885, H.M.S. *Ranger* reported a depth of 55 fathoms, sand and rock, about 18 miles south-eastward of Ras Al-Hadd, the approximate position being lat. 22° 23′ N., long. 60° 4′ E. The same vessel was unsuccessful when searching for this bank on a subsequent occasion, no bottom being obtainable at 80 fathoms; this bank is shewn on the charts.

The currents off Ras Al-Hadd are variable and strong, and are much influenced by the prevailing winds. During the South-west monsoon, it has been found to set northward along and parallel with the coast at from half a mile to 1½ miles an hour from Ras Madraka until abreast of Ras Al-Hadd; at the same time, the current sets south-eastward down the coast from Ras Abu Dáúd to Sur, and from thence about E.N.E. to Ras Al-Hadd, off which point the two currents appear to meet, both being deflected north-eastward and attaining a rate of about 2 knots, at times still further increased by the ebb stream along the southern shore of the gulf of Omán. Owing to this current vessels lying-to at night off Ras Al-Hadd have found themselves out of sight of land at daylight.

Ras Al-Hadd, the southern point of approach to the Persian Gulf, is also described in the Persian Gulf Pilot.

General chart 1012.

Place.—Suez. Obs. △ Lat. 29° 58′ N., Long. 32° 33′ E.

Meteorological Table compiled from 16 to 24 Years' Observations.

MONTH.	BAROMETER.* At 32° F. and Mean Sea Level. Mean. For Month.	Mean. Daily Range.	Absolute. Max.	Absolute. Min.	Absolute. Range.	AIR TEMPERATURE. Mean. For Month.	Mean. Max.	Mean. Min.	Mean. Range.	Absolute. Max.	Absolute. Min.	Absolute. Range.	Relative Humidity.	Cloud Amount, Scale, 0 to 10.	RAIN. Total Fall.	RAIN. No. of Days.	RAIN. Max. Fall in 24 hours.	WIND. Mean Force, Beaufort Scale.	Number of Days from N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	No. of Days Gales.	No. of Days Fogs.
	Ins.	Ins.	Ins.	Ins.	Ins.	°	°	°	°	°	°	°	%		Ins.		Ins.												
January -	30·08	—	—	—	—	56	67	46	21	78	34	44	58	2	0·20	3	—	—	10	2	1	2	5	4	2	4	1	—	—
February -	30·04	—	—	—	—	58	71	49	22	98	39	59	56	2	0·10	1	—	—	9	2	0	2	6	4	1	4	0	—	—
March -	29·98	—	—	—	—	63	76	53	23	99	38	61	50	2	0·08	2	—	—	12	1	0	2	6	3	2	5	0	—	—
April - -	29·92	—	—	—	—	70	84	58	26	102	45	57	46	1	0·12	1	—	—	15	1	0	1	6	2	1	4	0	—	—
May - -	29·90	—	—	—	—	76	92	64	28	113	50	63	44	1	0·15	1	—	—	18	2	0	1	4	1	0	5	0	—	—
June - -	29·86	—	—	—	—	81	96	68	28	117	61	56	45	0	0·00	0	—	—	23	1	0	0	1	1	0	4	0	—	—
July - -	29·78	—	—	—	—	84	98	72	26	108	61	47	49	0	0·00	0	—	—	23	2	0	0	1	1	0	3	1	—	—
August -	29·78	—	—	—	—	84	97	72	25	111	63	48	52	0	0·00	0	—	—	23	3	0	0	0	0	0	4	1	—	—
September -	29·90	—	—	—	—	80	93	69	24	107	59	48	53	0	0·00	0	—	—	23	2	0	0	1	0	0	3	1	—	—
October -	29·98	—	—	—	—	76	88	66	22	103	51	52	55	1	0·03	1	—	—	20	2	1	0	1	1	0	5	1	—	—
November -	30·04	—	—	—	—	67	77	56	21	94	39	55	57	1	0·06	1	—	—	15	3	1	1	2	2	1	4	1	—	—
December -	30·06	—	—	—	—	59	70	50	20	81	33	48	59	2	0·18	2	—	—	10	3	1	1	5	4	2	4	1	—	—
Means -	29·94	—	—	—	—	71	84	60	24	—	—	—	52	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Totals - -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·92	12	—	—	201	24	4	10	38	23	9	49	7	—	—
Absolute Values -	—	—	—	—	—	—	—	—	—	117	33	84	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of Yrs.' Obsns. -	24		—			23	17			16			19		24													—	

* Correction for Gravity = − ·04 in. *Not applied.*

Authority:—Annales du Bureau Central Météorlogique de France.

PLACE.—SUAKIN. OBS. ▲ LAT. 19° 7′ N., LONG. 37° 20′ E.

METEOROLOGICAL TABLE COMPILED FROM 4 YEARS' OBSERVATIONS.

MONTH.	BAROMETER,* At 32° F. and Mean Sea Level. Mean. For Month.	Mean. Daily Range.	Absolute. Max.	Absolute. Min.	Absolute. Range.	AIR TEMPERATURE. Mean. For Month.	Mean. Max.	Mean. Min.	Mean. Range.	Absolute. Max.	Absolute. Min.	Absolute. Range.	Relative Humidity.	Cloud Amount, Scale 0 to 10.	RAIN. Total Fall.	RAIN. No. of Days.	RAIN. Max. Fall in 24 hours.	WIND. Mean Force, Beaufort Scale.	Number of Days from N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	No. of Days Gales.	No. of Days Fogs.
	Ins.	Ins	Ins.	Ins.	In.	°	°	°	°	°	°	°	°/°		Ins.		Ins.												
January	30·01	—	30·21	29·78	0·43	75	81	68	13	91	58	33	73	5	0·74	2·5	—	4	14	1	3	0	1	0	5	6	1	—	—
February	30·03	—	30·26	29·82	0·44	73	79	67	12	86	59	28	72	5	0·37	1·5	—	2	10	2	2	0	0	0	4	10	0	—	—
March	29·93	—	30·12	29·69	0·43	75	81	68	13	89	56	33	76	2	0·00	0·0	—	3	9	3	3	0	1	0	3	10	2	—	—
April	29·89	—	30·13	29·71	0·42	79	86	72	14	93	62	31	77	1	0·00	0·0	—	2	10	3	3	0	0	0	3	8	3	—	—
May	29·84	—	29·98	29·72	0·26	84	93	75	18	100	63	37	66	1	0·12	0·3	—	2	10	4	3	0	0	0	3	7	4	—	—
June	29·77	—	29·93	28·61	0·32	91	102	79	23	118	72	46	54	1	0·03	0·3	—	2	8	3	3	1	1	0	6	5	3	—	—
July	29·74	—	29·87	29·63	0·24	95	108	82	26	119	76	43	46	2	0·09	0·3	—	2	5	3	4	1	2	3	7	5	1	—	—
August	29·72	—	29·88	29·58	0·30	97	109	84	25	118	77	41	56	2	0·03	0·3	—	3	5	4	4	1	3	3	6	4	1	—	—
September	29·82	—	29·97	29·62	0·35	90	101	79	22	117	66	51	60	2	0·00	0·0	—	—	8	4	3	1	3	1	4	4	2	—	—
October	29·92	—	30·06	29·77	0·29	83	93	73	20	100	59	41	70	3	2·06	1·8	—	—	12	4	2	0	1	0	4	6	2	—	—
November	29·98	—	30·19	29·64	0·55	80	88	72	16	96	55	41	74	5	2·90	7·0	—	3	10	2	3	0	1	0	9	5	0	—	—
December	30·03	—	30·24	29·89	0·36	75	83	67	16	90	52	38	74	4	1·26	4·3	—	3	9	2	2	0	0	0	11	6	1	—	—
Means	29·89	—	—	—	—	83	92	73	19	—	—	—	67	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·60	18·3	—	—	110	35	35	4	13	7	65	76	20	—	—
Absolute Values	—	—	30·26	29·58	0·68	—	—	—	—	119	52	67	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* Correction for Gravity = − 0·06. *Not applied.*

Authority—Meteorological Report (Egypt).

Place.—Massawa. Obs. △ Lat. 15° 37′ N., Long. 39° 27′ E.

Meteorological Table compiled from 1 to 11 Years' Observations.

Month.	Barometer* At 32° F. and Mean Sea Level. Mean. For Month.	Barometer. Mean. Daily Range.	Barometer. Absolute. Max.	Barometer. Absolute. Min.	Barometer. Absolute. Range.	Air Temperature. Mean. For Month.	Air Temperature. Mean. Max.	Air Temperature. Mean. Min.	Air Temperature. Mean. Range.	Air Temperature. Absolute. Max.	Air Temperature. Absolute. Min.	Air Temperature. Absolute. Range.	Relative Humidity.	Cloud Amount, Scale 0 to 10.	Rain. Total Fall.	Rain. No. of Days.	Rain. Max. Fall in 24 hours.	Wind. Mean Force, Beaufort Scale.	Wind. Number of Days from N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	No. of Days Gales.	No. of Days Fogs.
	Ins.	Ins.	Ins.	Ins.	Ins.	°	°	°	°	°	°	°	%		Ins.		Ins.												
January	29·98	—	—	—	—	78	—	—	—	92	66	26	85	6	1·62	6	—	3	8	8	4	1	0	1	4	3	2	0	0
February	29·93	—	—	—	—	78	—	—	—	93	66	27	84	5	0·79	6	—	2	7	5	4	1	1	1	4	3	2	0	0
March	29·88	—	—	—	—	81	—	—	—	95	68	27	80	5	0·66	7	—	2	10	10	3	1	1	1	0	4	1	0	0
April	29·85	—	—	—	—	85	—	—	—	97	71	26	79	5	0·07	3	—	2	11	8	4	0	0	0	2	1	4	0	0
May	29·82	—	—	—	—	86	—	—	—	104	77	27	63	3	0·46	2	—	3	17	3	0	3	1	0	1	2	4	0	0
June	29·72	—	—	—	—	92	—	—	—	106	77	29	52	2	0·00	0	—	2	8	4	3	3	1	1	6	2	2	—	—
July	29·71	—	—	—	—	94	—	—	—	108	85	23	59	3	0·12	0	—	2	11	5	4	5	1	0	2	2	1	—	—
August	29·70	—	—	—	—	94	—	—	—	109	84	25	49	3	0·20	0	—	2	6	10	4	5	6	0	0	0	0	—	—
September	29·76	—	—	—	—	92	—	—	—	106	66	40	52	2	0·26	1	—	2	8	13	0	1	8	0	0	0	0	—	—
October	29·87	—	—	—	—	90	—	—	—	98	77	21	69	1	0·32	0	—	2	7	9	1	1	11	2	0	0	0	—	—
November	29·94	—	—	—	—	83	—	—	—	95	75	20	68	4	0·62	2	—	2	7	7	2	5	3	0	4	1	1	0	0
December	29·97	—	—	—	—	80	—	—	—	91	68	23	73	3	2·00	3	—	2	7	6	3	5	3	1	4	2	0	0	0
Means	29·84	—	—	—	—	86	—	—	—	—	—	—	68	4	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7·12	30	—	—	107	88	32	31	36	7	27	20	17	—	—
Absolute Values	—	—	—	—	—	—	—	—	—	109	66	43	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
No. of Years' Observations.	11		—			6	—	—	—	3			1	3	11	3	—	6											

* Correction for Gravity = − 0·07. *Not applied.*

Authorities :—Handbuch der Klimatologie (Hann); Annali dell'Ufficio Centrale Meteorologies... Italiano; Meteorologische Zeitschrift; Buchan's "Challenger" Report; Meteorological Office Data

PLACE.—PERIM. OBS. △ LAT. 12° 39′ N., LONG. 43° 26′ E.

METEOROLOGICAL TABLE COMPILED FROM 11 YEARS' OBSERVATIONS.

MONTH.	BAROMETER.* At 32° F. and Mean Sea Level (8 a.m.)					AIR TEMPERATURE.							Relative Humidity.	Cloud Amount, Scale 0 to 10.	RAIN.†			WIND.										No. of Days Gales.	No. of Days Fogs.
	Mean.		Absolute.			Mean.				Absolute.								Mean Force, Beaufort Scale.	Number of Days from										
	For Month.	Daily Range.	Max.	Min.	Range.	For Month.	Max.	Min.	Range.	Max.	Min.	Range.			Total Fall.	No. of Days.	Max. Fall in 24 hours.		N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.		
	Ins.	Ins.	Ins.	Ins.	Ins.	°	°	°	°	°	°	°	%	8 a.m.	Ins.		Ins.												
January	30·05	—	30·19	29·90	0·29	77	83	73	10	86	60	26	73	5	0·43	0·7	0·54	5	0	1	12	14	2	0	0	1	1	—	—
February	30·01	—	30·24	29·81	0·43	78	84	74	10	87	68	19	76	6	0·36	1·4	0·36	5	0	2	9	13	1	0	1	1	1	—	—
March	29·96	—	30·12	29·75	0·37	79	85	76	9	92	70	22	77	5	0·37	0·8	1·00	5	1	1	9	14	3	1	1	1	0	—	—
April	29·91	—	30·06	29·74	0·32	82	89	79	10	96	72	24	78	4	0·01	0·3	0·21	4	1	0	8	15	3	0	1	2	0	—	—
May	29·85	—	30·00	29·69	0·31	86	93	82	11	101	72	29	76	4	0·37	0·3	2·20	4	1	1	10	9	2	1	3	3	1	—	—
June	29·76	—	29·94	29·61	0·33	88	95	83	12	104	72	32	68	4	0·00	0·0	1·35	4	1	3	4	2	1	2	6	10	1	—	—
July	29·75	—	29·87	29·59	0·28	90	96	83	13	107	72	35	60	4	0·17	0·3	0·90	4	2	1	2	2	0	4	8	11	1	—	—
August	29·76	—	29·93	29·65	0·28	90	96	83	13	109	73	36	62	4	0·43	0·7	1·66	4	1	3	2	2	1	3	8	10	1	—	—
September	29·83	—	29·99	29·67	0·32	88	95	83	12	102	76	26	67	4	0·01	0·1	0·09	3	2	5	6	5	1	1	3	7	0	—	—
October	29·95	—	30·16	29·77	0·39	84	91	81	10	98	76	22	71	2	0·05	0·1	0·47	5	0	2	8	18	2	0	0	0	1	—	—
November	30·02	—	30·15	29·85	0·30	81	87	77	10	93	73	20	69	3	0·05	0·2	0·24	5	0	1	10	16	3	0	0	0	0	—	—
December	30·06	—	30·23	29·94	0·29	79	84	75	9	90	65	25	68	4	0·07	0·5	0·90	5	0	1	12	14	3	1	0	0	0	—	—
Means	29·91	—	—	—	—	84	90	79	11	—	—	—	70	4	—	—	—	4	—	—	—	—	—	—	—	—	—	—	—
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2·32	5·4	—	—	9	21	92	124	22	69	31	46	7	27	—
Absolute Values	—	—	30·24	29·59	0·65	—	—	—	—	109	60	49	—	—	—	—	2·20	—	—	—	—	—	—	—	—	—	—	—	—

* Correction for Gravity = − ·07. *Not applied.*

† The max. rainfall is for the years 1893–1902; the remainder of the values are for the eleven years ending 1900.

Authorities:—Indian Meteorological Memoirs; India Weather Review.

Place—Zeila. Obs. △ Lat. 11° 21′ 30″ N., Long. 43° 29′ 0″ E.

Meteorological Table compiled from One Year's Observations.

MONTH.	BAROMETER, reduced to 32° and Sea Level.		TEMPERATURE.				Relative Humidity.	Clouds, 0 to 10 Mean Amount.	RAIN.		Average Hourly Velocity.	WIND.									No. of Days Gales.	No. of Days Fogs.	REMARKS.
												Number of Days from											
	Mean Height.	Extreme Range.	Mean.	Mean Daily Range.	Max.	Min.			Total fall.	No. of days.		N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.			
	Ins.	Ins.	°	°	°	°			Ins.														
January	29·98		78					4		—													
February	29·94		79					6		8		0	8	16	0	0	0	0	1	3			
March	29·89		81					5		8		1	12	12	0	1	0	1	0	4			
April	29·80		85					5		5		0	14	4	9	0	0	0	1	2			
May	29·78		88					5		14		1	10	2	8	0	2	0	0	8			
June	29·67		89					3		4		2	6	0	5	0	1	3	5	8			
July	29·68		89					5		11		1	9	2	1	0	0	4	6	8			
August	29·65		91					4		3		1	8	3	2	0	0	3	6	8			
September	29·73		91					4		0		0	8	5	4	0	0	3	1	9			
October	29·90		87					4		3		0	8	5	8	1	2	0	0	7			
November	29·96		84					6		3		0	11	0	9	1	1	0	0	8			
December	30·00		78					3		2		0	5	14	5	0	1	0	0	6			
Means and Totals	29·83		85					4															

PLACE—ADEN. OBS. △ LAT. 12° 47′ N., LONG. 44° 59′ E.

METEOROLOGICAL TABLE COMPILED FROM 10 TO 33 YEARS' OBSERVATIONS.

MONTH.	BAROMETER,* at 32° F. and Mean Sea Level. Mean. For Month.	Mean. Daily Range.	Absolute. Max.	Absolute. Min.	Absolute. Range.	AIR TEMPERATURE. Mean. For Month.	Mean. Max.	Mean. Min.	Mean. Range.	Absolute. Max.	Absolute. Min.	Absolute. Range.	Relative Humidity.	Cloud Amount, Scale, 0 to 10.	RAIN. Total fall.	No. of Days.	Max. fall in 24 hours.	WIND. Mean force, Beaufort scale.	Number of Days from N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	No. of Days Gales.	No. of Days Fogs.
	Ins.	Ins.	Ins.	Ins.	Ins.	°	°	°	°	°	°	°	%		Ins.		Ins.												
January	30·04	0·11	30·25	29·83	0·42	76	81	73	8	86	65	21	72	4	0·27	1·0	0·54	4	1	7	13	6	1	1	0	0	2	—	—
February	30·02	0·12	30·27	29·80	0·47	77	82	73	9	90	66	24	73	4	0·23	0·4	1·20	4	0	7	13	5	1	0	0	0	2	—	—
March	29·96	0·12	30·20	29·74	0·46	79	84	75	9	98	67	31	73	3	0·74	0·9	1·55	4	1	8	14	4	1	1	0	0	2	—	—
April	29·90	0·12	30·11	29·70	0·41	81	89	77	12	101	69	32	71	2	0·25	0·5	0·13	4	0	7	14	2	2	2	0	1	2	—	—
May	29·83	0·12	30·05	29·55	0·50	86	93	81	12	102	70	32	70	2	0·17	0·4	0·51	3	1	5	8	4	5	4	1	0	3	—	—
June	29·71	0·12	29·96	29·51	0·45	89	95	84	11	102	76	26	64	2	0·04	0·1	1·00	3	0	1	2	5	11	8	1	0	2	—	—
July	29·67	0·13	29·91	29·46	0·45	88	93	82	11	102	70	32	63	3	0·04	0·1	0·60	3	0	0	1	7	12	9	0	0	2	—	—
August	29·69	0·14	29·90	29·48	0·42	86	92	80	12	100	69	31	65	3	0·13	0·2	0·02	3	0	1	1	7	12	7	1	0	2	—	—
September	29·79	0·12	30·03	29·53	0·50	87	94	82	12	100	72	28	66	3	0·12	0·2	1·30	3	0	3	4	6	8	5	1	0	3	—	—
October	29·94	0·11	30·15	29·74	0·41	82	90	78	12	100	70	30	69	1	0·01	0·1	0·00	4	0	7	11	4	4	2	1	0	2	—	—
November	30·01	0·11	30·18	29·80	0·38	79	85	75	10	97	68	29	68	2	0·13	0·4	0·83	4	0	7	13	5	2	1	0	0	2	—	—
December	30·06	0·10	30·22	29·87	0·35	77	82	73	9	93	64	29	70	3	0·13	0·6	0·15	4	0	8	13	6	2	0	0	0	2	—	—
Means	29·89	0·12	—	—	—	82	88	78	10	—	—	—	69	3	—	—	—	4	—	—	—	—	—	—	—	—	—	—	—
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2·26	4·9	—	—	3	61	107	61	61	40	5	1	26	—	—
Absolute values.	—	—	30·27	29·46	0·81	—	—	—	—	102	64	38	—	—	—	—	1·55	—	—	—	—	—	—	—	—	—	—	—	—
No. of year's observations.	23																10	21											

* Corrections for Gravity = − ·07. *Not applied.*

Authorities:—Indian Meteorological Memoirs; Indian Weather Review.

Place—Jidda. Obs. △ Lat. 21° 28′ N., Long. 39° 11′ E.

Meteorological Table compiled from 11 Years' Observations.

Month.	Barometer,* at 32° F. and Mean Sea Level. Mean. For Month.	Barometer. Mean. Daily Range.	Barometer. Absolute. Max.	Barometer. Absolute. Min.	Barometer. Absolute. Range.	Air Temperature. Mean. For Month.	Air Temperature. Mean. Max.	Air Temperature. Mean. Min.	Air Temperature. Mean. Range.	Air Temperature. Absolute. Max.	Air Temperature. Absolute. Min.	Air Temperature. Absolute. Range.	Relative Humidity.	Cloud Amount, Scale, 0 to 10.	Rain. Total fall.	Rain. No. of Days.	Rain. Max. Fall in 24 hours.	Wind. Mean force, Beaufort scale.	Wind. Number of days from N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	No. of Days Gales.	No. of Days Fogs.
	Ins	Ins.	Ins.	Ins.	Ins.	°	°	°	°	°	°	°	%		Ins.		Ins.												
January	29·95	—	30·21	29·73	0·48	73	78	68	10	85	58	27	69	1	—	1	—	2	11	4	1	1	3	2	2	6	1	0	—
February	29·94	—	30·16	29·59	0·57	71	76	66	10	86	56	30	66	1	—	2	—	2	13	3	1	0	2	1	4	3	1	0	—
March	29·85	—	30·08	29·55	0·53	77	82	72	10	89	59	30	69	1	0	0	—	2	12	2	2	1	3	1	4	4	2	1	—
April	29·82	—	30·08	29·54	0·54	80	85	75	10	93	63	30	69	1	0	0	—	2	10	1	1	0	5	3	3	4	3	0	—
May	29·77	—	29·92	29·56	0·36	83	88	77	11	107	63	44	69	1	0	0	—	2	12	1	0	1	2	2	3	9	1	0	—
June	29·65	—	29·90	29·50	0·40	85	91	79	12	114	71	43	70	1	0	0	—	2	13	1	0	0	0	1	3	11	1	1	—
July	29·68	—	29·84	29·49	0·35	87	92	82	10	103	72	31	68	1	0	0	—	2	10	1	0	1	1	2	6	8	2	2	—
August	29·67	—	29·85	29·49	0·36	88	93	83	10	100	74	26	70	2	0	0	—	2	7	1	0	1	1	3	7	9	2	0	—
September	29·73	—	20·95	29·52	0·43	86	91	81	10	104	66	38	76	2	0	0	—	2	9	1	0	0	1	1	4	12	2	2	—
October	29·81	—	29·99	29·67	0·32	84	89	78	11	93	71	22	75	1	0	0	—	2	7	2	1	0	1	2	6	7	5	0	—
November	29·88	—	30·08	29·72	0·36	80	85	75	10	94	65	29	72	1	—	1	—	2	8	2	1	1	1	2	5	6	4	0	—
December	29·92	—	30·16	29·75	0·41	77	82	72	10	86	63	23	70	2	—	1	—	2	7	3	3	1	2	2	4	6	3	4	—
Means	29·81	—	—	—	—	81	86	76	10	—	—	—	70	1	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—
Totals	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	—	—	119	22	10	7	22	22	51	85	27	10	—
Absolute values	—	—	30·21	29·49	0·72	—	—	—	—	114	56	58	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Authority:—Nederlandsch Meteorologisch Jaarboek.

* Corrections for gravity = − ·06. *Not applied.*

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Sailing directions for the West coasts of Central America and the United States from the Bay of Panama to Juan de Fuca strait, 2nd edition, 1907 - - - - -	4	6
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* *Note.*—The Agents in Tokyo for Japanese charts are the Nippon Yusen Kaisha.

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